UNIVERSITY OF WINCHESTER

Investigating the Effects of Anxiety and Depression on Eyewitness Memory

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ABSTRACT

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In recent years, vulnerability has received increased attention within a forensic context and key methods of eliciting accurate and reliable recall and identification from vulnerable witnesses have been developed (Ministry of Justice, 2011). However, the eyewitness capabilities of witnesses with a mental health problem both at interview and cross-examination are not well understood. The literature on mental health and eyewitness performance is extremely limited particularly regarding common problems, such as anxiety and depression. Also, we do not fully understand how legal professionals and jurors perceive witnesses with a mental health problem. The first study of this thesis explored legal professionals' perceptions of witnesses with anxiety and depression and found that professionals frequently come into contact with such witnesses but the reliability of their evidence is often questioned and this is based on previous experience rather than robust evidence-based sources. Additionally, many felt that not only were changes needed to the ways such witnesses are currently interviewed, but that they should be given additional support and further mental health awareness training should be provided for professionals. The second study examined the effects of mental health on memory recall and

identification accuracy. Three groups emerged: sub-clinical anxiety and depression, sub-clinical anxiety, and typical (with no mental health problems). No significant group differences in memory recall or identification accuracy were found. The third study assessed the cross-examination performance of the same three witness groups and no significant differences in cross-examination performance (measured by memory trace strength and 'resistance' to challenges) emerged between groups. The fourth study explored mock jurors' perceptions of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, compared to a typical witness with no mental health problems either with or without the provision of knowledge regarding the witness's mental health status. The witness with sub-clinical anxiety and depression was seen to be less credible than the other witnesses and the mock jurors were more likely to consider the defendants to be not guilty after viewing the witnesses with a mental health problem. Both findings were irrespective of whether or not the mock jurors were informed of the witness's mental health status. The findings of this thesis are discussed in relation to their real-world implications and directions for future research.

Keywords: Mental health, interviewing, cross-examination, eyewitness identification, eyewitness memory, juror perceptions

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Chapter 1

Literature Review

1.1. General Introduction

Within the last decade, vulnerability and its place within the Criminal Justice System (CJS) has become increasingly important. This is evident from recent publications of guidance on suggested procedures for the effective participation of vulnerable witnesses during the legal process (Cooper & Norton, 2017; Ministry of Justice, 2011). Due to this increased interest, research has developed key techniques to enhance accurate and reliable recall and facial identification evidence from vulnerable witnesses, such as children and those with intellectual disabilities (ID). It has been questioned whether witnesses deemed 'vulnerable' by the CJS are able to provide their best evidence and consequently such techniques are recommended in order to support them during this process (Ministry of Justice, 2011). However, there is a lack of understanding of the eyewitness performance capabilities of witnesses with a mental health problem. The literature on mental health and eyewitness performance, both memory recall and identification lineup performance, is extremely limited and more research needs to be conducted particularly regarding common problems, such as anxiety and depression. Furthermore, we do not fully understand how professionals working with this group perceive them as witnesses or indeed how jury members perceive their evidence in a court of law. Further research into these issues may help improve the ways in which such witnesses are supported and may ultimately lead to a greater number of successful convictions and prosecutions.

The principal aims of this thesis are 1) to explore legal professionals' attitudes towards and perceptions of vulnerable witnesses with anxiety and depression, 2) to examine the effects of anxiety and depression on memory accuracy (at interview) and identification accuracy (on identification lineups), 3) to assess the effects of anxiety and depression on memory accuracy and cede performance at cross-examination, and 4) to explore mock jurors' perceptions of witnesses with anxiety and depression. These aims will enhance our understanding of 1) how such witnesses are perceived at different stages of the criminal justice process and 2) their capabilities of providing accurate and reliable witness evidence.

This chapter will review the literature that is relevant to this thesis. Firstly, it will describe the importance of witnesses within the CJS and outline the cognitive processes involved in eyewitness memory, including relevant psychological theories of memory. It will then discuss the impact of vulnerability on eyewitness performance before introducing mental health as a specific vulnerability. The effects of anxiety and depression on general memory will be described first, followed by the impact that they have on eyewitness performance more specifically. This will include a discussion of the interviewing techniques and identification procedures used with vulnerable witnesses, and the psychological theories underpinning such techniques. Then, cross-examination will be introduced and research on vulnerability and cross-examination will be reviewed. Finally, literature on the perceptions of vulnerable witnesses will be discussed, specifically with reference to the perceptions of jurors and legal professionals.

1.2. Importance of Witnesses in the Criminal Justice System

In England and Wales, the Criminal Justice System (CJS) is the term used to describe "the institutions and agencies which respond officially to the commission of offences" (Hucklesby & Wahidin, 2013, p. 5). These agencies include: the police, the courts, the Home Office, the Ministry of Justice, the Crown Prosecution Service (CPS), the Law Officers, the Serious Fraud Office, Her Majesty's Court Service, and Her Majesty's Prison and Probation Service. They are interdependent and rely on one another to contribute to the criminal justice process. The main aims of the system are 1) to detect and prevent crime, 2) to rehabilitate and punish offenders, and 3) to support victims and witnesses of crime (McMurran, Khalifa, & Gibbon, 2009).

During any criminal investigation, there are two primary investigative questions that police officers aim to answer: 1) what has happened and 2) who is responsible for the crime (Milne & Bull, 2006). In order to answer these questions, certain information is required and one important source of such information is witnesses (Kocsis, 2009). Published research in the USA has shown that witnesses are a central and important feature of a criminal investigation (Sanders, 1986). This has been mirrored in the UK (Kebbell & Milne, 1998) with research suggesting that they are the cornerstone of criminal investigations as often there is no other forensically relevant information to assist with the case (Milne & Bull, 1999). Not only do witnesses provide central leads within an investigation and prompt further lines of enquiry (Berresheim & Weber, 2003) but they also reveal other potential

sources of information (Heaton-Armstrong, Shepherd, Gudjonsson, & Wolchover, 2006). Furthermore, witness evidence is often regarded by the prosecution as being more significant to a case than an offender's own confession (Wolchover & Heaton-Armstrong, 1996). However, the success of any investigation relies heavily on the detail and accuracy of witness statements (College of Policing, 2013b; Cutler, Penrod, & Dexter, 1990) and consequently it is vital that witness evidence presented at interview and court is as accurate as possible to prevent miscarriages of justice. Yet, human memory is fragile and often fallible which has significant implications for the CJS when considering the use of eyewitness accounts (Milne & Bull, 1999). These implications will now be discussed in relation to eyewitness memory.

1.3. Eyewitness Memory

Memory is an active process that involves the reconstruction of an event, an object, or a person (Davies, Hollin, & Bull, 2008). This process is typically divided into three distinct stages: 1) encoding, during which a memory is created by the observer, 2) retention, during which the memory is stored for later retrieval, and 3) retrieval, during which the memory is accessed (Smith, Ryder, & Flowe, 2018). Memory is critical for eyewitness performance and the three stages of memory are central to understanding how a witness remembers a crime (Smith et al., 2018). When a witness is asked to identify a perpetrator or recall details of an event, they will access information stored in memory to reconstruct the person or event. The encoding of information takes place when the witness first observes the crime and physical and sensory information from the environment enters into the memory, such as the perpetrator's appearance. Once this material has entered the memory system, it is stored for later use in the retention stage. At interview and/or court, the witness may be required to describe the perpetrator's appearance and so attempts are made to recover this detail (Milne & Bull, 1999; O'Donohue & Levensky, 2004).

With regard to the encoding stage, it is important to briefly discuss the difference between intentional and incidental encoding. Intentional encoding occurs when we make a conscious attempt to encode information about an event or a person. We may, for example, try to encode the name of a person with whom we have just met for the first time. Incidental encoding, however, occurs when we encode details without being consciously aware that we are doing so (Radvansky, 2017). It is incidental encoding that is more pertinent to eyewitness memory as, in most cases, a witness will not consider that

they may be asked about the crime at a later stage and/or they may not realise that they have witnessed a crime and consequently will not intentionally encode details about the event in their memory whilst it is taking place. However, for ethical reasons, it is often necessary to inform participants in eyewitness research about the nature of the research and the types of questions that will be asked and so it can be difficult to replicate incidental encoding. With regard to the retrieval stage, it is important to distinguish between two forms of memory: implicit and explicit. Implicit memory is regarded as an unconscious process and represents our overall knowledge of the world. It is a more general form of memory that is context-free (Rovee-Collier, Hayne, & Colombo, 2001). Explicit memory, on the other hand, is often referred to as our 'everyday' memory as we use this form of memory for recall and recognition of events and persons (Rovee-Collier et al., 2001). With explicit memory, we are consciously aware of retrieving a memory of a past experience or person and it is this form that is particularly relevant to this thesis. Since eyewitness memory relies heavily on the ability to recall details of an event and/or recognise a perpetrator, explicit memory is essential (Girod, 2015). Furthermore, there are three main memory systems: semantic, episodic, and procedural. Semantic memory is memory for facts and general knowledge about the world, such as remembering a capital city of a country. Episodic memory is a person's unique memory of a specific event and is sometimes referred to as 'autobiographical' memory. Procedural memory enables us to remember how to do things and perform certain actions, such as riding a bicycle (Hasselmo, 2012). For eyewitness performance, episodic memory is crucial as a witness must be able to recall information about a specific one-off event.

Memory is a constructive process that is prone to error and heavily influenced by the environment (Griffiths & Milne, 2010). A witness's memory of an event can be easily contaminated causing recall to be imperfect (Schacter, Guerin, & St Jacques, 2011). In forensic enquiries, there are a number of regulations that help to protect a forensic scene but it is very difficult to prevent the contamination of human memory due to its high degree of fragility (Davies, Hollin, & Bull, 2008; Milne & Bull, 1999). It is best to obtain immediate recall from a witness in order to preserve the memory of the event. However, this rarely happens in the real world as often witnesses come into contact and discuss the event with other persons before the police have arrived at the scene. Sometimes, a witness may have left the scene and it may be weeks or even months before their recall is obtained. With this in mind, as well as the fact that human memory is already fragile, it is perhaps unsurprising that a witness's memory can be easily distorted. Research has shown

that inaccurate information provided by co-witnesses is commonly integrated into the witness's evidence (Gabbert, Memon, & Allan, 2003; Gabbert, Memon, Allan, & Wright, 2004) and further research has revealed that such information is more likely to be recalled by the witness than misleading information presented during questioning (Paterson & Kemp, 2006a, cited in Paterson, Kemp, & Ng, 2011). Other research has demonstrated that an opportunity for early recall enhances recollection and protects the memory against the negative effects of inaccurate information presented after the event (Gabbert, Hope, Fisher, & Jamieson, 2012).

1.3.1. System and Estimator Variables

Two of the most widely documented types of variables known to affect eyewitness performance are system and estimator variables (Wells, 1978). System variables are variables that the CJS has control over, such as interview methods and lineup instructions (Wells, Memon, & Penrod, 2006) and these variables have the potential to reduce eyewitness inaccuracies. Estimator variables are variables that influence eyewitness performance but cannot be controlled for by the CJS, such as witness characteristics (Wells et al., 2006). Much of the research has focused on system variables which are often used to enhance identification methods (Davies et al., 2008). This is not to say that estimator variables are less important. In fact, such variables are significant in assessing the likely performance of eyewitnesses in certain circumstances. However, regulating these variables in real-life situations can prove challenging. Examples of estimator variables that have been known to impact eyewitness memory include: age (Yarmey, 2001), gender (Shaw & Skolnick, 1994), and race (Wright, Boyd, & Tredoux, 2001). This also appears to be the case with certain situational variables, such as stress (Deffenbacher, Bornstein, Penrod, & McGorty, 2004; Koopman, Classen, & Spiegel, 1994) and trauma (Risan, Binder, & Milne, 2016). A further variable that has the capacity to impact eyewitness memory is vulnerability. Whilst the present research is focusing on one particular vulnerability (mental health), there are other areas of vulnerability that are outside the scope of this thesis such as age (e.g., La Rooy, Lamb, & Pipe, 2009) and intellectual capabilities (e.g., Gudjonsson & Henry, 2003).

1.4. Vulnerability and Eyewitness Performance

As previously mentioned, there are certain variables that have the capacity to influence the quality and quantity of eyewitness evidence. However, witness vulnerability is a variable that is less understood in relation to eyewitness performance, although advances have been made to the ways in which evidence is obtained from individuals deemed vulnerable in recent years (Davies, 2016). The current official guidance, Achieving Best Evidence (ABE) in Criminal Proceedings (Ministry of Justice, 2011), is a set of recommendations that was produced in England and Wales to "assist those responsible for conducting video-recorded interviews with vulnerable, intimidated and significant witnesses, as well as those tasked with preparing and supporting witnesses during the criminal justice process" (Ministry of Justice, 2011, p. 1). Whilst this guidance is advisory rather than mandatory, there must be a strong justification put forward at court if its recommendations are not followed (Davies & Westcott, 2018). According to the ABE guidance, there are four types of vulnerable witness which include: children under 18 years of age, witnesses who have a mental disorder as defined by the Mental Health Act (1983, as amended by the Mental Health Act, 2007), witnesses significantly impaired in relation to intelligence and social functioning (witnesses who have a learning disability), and witnesses who have a physical disability (Ministry of Justice, 2011). It has been estimated that approximately 54% of witnesses who produce statements are deemed vulnerable (Smith & Tilney, 2007) and it is therefore vital that the eyewitness performance of vulnerable witnesses is clearly understood.

Research exploring the accuracy of eyewitnesses has addressed two separate components of eyewitness performance: 1) the ability of the witness to recall details of the crime (eyewitness memory) and 2) the ability of the witness to recognise the perpetrator of the crime (eyewitness identification). There is evidence within the literature to suggest that vulnerability can impact both. In terms of eyewitness memory, it has been found that memory recall is influenced by age with children in early years of development demonstrating poorer recall than older children (e.g., La Rooy et al., 2009; Lewy, Cyr, & Dion, 2015). It has also been revealed that children with ID are worse than typically developed children at remembering details (e.g., Henry & Gudjonsson, 2003; Henry & Gudjonsson, 2004; McCrory, Henry, & Happé, 2007) and similar findings have been demonstrated in adults with ID (e.g., Gudjonsson & Henry, 2003; Maras & Bowler, 2014; Ternes & Yuille, 2008). Furthermore, an additional group that is often considered

'vulnerable' is elderly witnesses and it has been shown that eyewitness memory of adults in older age is worse than younger adult witnesses (e.g., West & Stone, 2014). Whilst there is some research to suggest that eyewitness memory skills are not always influenced by vulnerability (e.g., Collins & Henry, 2016), the general consensus within the literature is that vulnerability poses problems when it comes to gathering reliable memory recall from vulnerable witnesses. Moreover, it seems that a witness's vulnerability is not only capable of impacting memory performance but also identification performance. Within the literature, there are a number of eyewitness studies involving adults with ID (e.g., Henry & Wilcock, 2013) and elderly adults (e.g., Erickson, Lampinen, & Moore, 2016; Havard & Memon, 2009; Wilcock & Bull, 2010) that have demonstrated that identification performance of witnesses deemed vulnerable is reliably worse than that of their typical counterparts. The findings of previous research that has explored memory enhancing interviewing techniques and identification methods used with vulnerable witnesses will be discussed later in this thesis.

1.4.1. Mental Health

One type of psychological vulnerability that has received very little attention with regard to eyewitness performance is mental health. The Mental Health Act (2007) defines 'mental disorder' as "any disorder or disability of the mind" (Mental Health Act, 2007, Chapter 12, p. 6). According to the Mental Health Foundation (2019), one in six people in the UK experience a mental health disorder of some kind each week (Mental Health Foundation, 2019a); however, despite its importance, literature regarding mental health in relation to eyewitness performance is sparse and as a result the witness capabilities of vulnerable persons with a mental health disorder are unclear. There is, however, a larger body of research on mental health in relation to general memory and cognition, and such research will be discussed in the next section. This thesis will be looking at sub-clinical cases of mental health for which a mental health diagnosis has not been given but due to there being limited literature on sub-clinical mental health problems, most of the literature that will be reviewed has explored clinical mental health disorders.

1.5. Mental Health and General Memory

Cognition refers to the intellectual skills that allow us to acquire, store, and transform information (Eysenck, 2012). As the range of mental health disorders is wide, the

impact that they have on cognition varies. For example, schizophrenia and other psychotic disorders are associated with abnormalities such as delusions, hallucinations, and disorganised speech (American Psychiatric Association (APA), 2013), whereas depressive disorders are associated with symptoms such as severe irritability, diminished ability to think or concentrate, and sometimes recurrent thoughts of death (APA, 2013). Furthermore, it has been found that individuals with post-traumatic stress disorder (PTSD) experience cognitive deficits on tasks of sustained attention and working memory (Vasterling et al., 2002) and also find it difficult to retrieve specific autobiographical memories (McNally, Lasko, Macklin, & Pitman, 1995).

Memory is affected by mental health in various ways depending upon the individual mental health disorder but a common factor that is evident across the studies described above is that memory and cognition can be impacted. This is likely to have significant implications for the criminal justice process if and when an individual with a mental health problem is required to provide evidence as an eyewitness at interview and/or court. However, there is only a limited number of studies that have examined the effects of mental health on eyewitness memory and identification performance. This thesis will explore this issue with a focus on anxiety and depression; two of the most prevalent mental health disorders.

1.5.1. Anxiety and Depression

Anxiety and depression are amongst the most prevalent mental health disorders in the UK, and mixed anxiety and depression is the most common (Mental Health Foundation, 2019b). Research has revealed that the prevalence rate for anxiety in adults over the age of 16 is 5.9% whilst the prevalence rate for depression is slightly lower at 3.3% (Stansfeld et al., 2016). For both combined, the prevalence rate is higher at 7.8% (Mental Health Foundation, 2019b).

The Diagnostic and Statistical Manual of Mental Disorders – Fifth Edition (DSM-5) defines and classifies a range of mental health disorders, and includes criteria intended to facilitate the reliable diagnosis of each disorder (APA, 2013). According to this latest edition, anxiety disorders "share features of excessive fear and anxiety and related behavioral disturbances" (APA, 2013, p. 189) and examples of such disorders include: generalized anxiety disorder, separation anxiety disorder, social anxiety disorder, panic disorder, and agoraphobia (APA, 2013). Anxiety can be separated into two distinct forms: state and trait.

Carducci (2009) defines state anxiety as "a temporary change in anxiety in response to an external threat" (p. 578) and trait anxiety as "an enduring characteristic of the individual's personality" (p. 578). It is the latter form of anxiety on which this thesis is focusing as its aim is to explore the effects of an in-built, permanent form of anxiety. In terms of the neural bases of anxiety disorders, functional brain-imaging studies involving emotional tasks have shown that there is a strong association between anxiety and changes in the amygdala and the anterior cingulate cortex within the brain (e.g., Kim & Whalen, 2009; Melcher, Falkai, & Gruber, 2008). One may argue that this is to be expected considering that anxiety is a disturbance of emotion and these brain areas play a key role in emotional regulation (Mayberg et al., 2005).

According to the DSM-5, a common feature of depressive disorders is "the presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function" (APA, 2013, p. 155), and examples of such disorders include: disruptive mood dysregulation disorder, major depressive disorder, persistent depressive disorder, and substance/medication-induced depressive disorder (APA, 2013). The emotional states associated with depressive disorders vary from everyday moods of sadness to psychotic episodes with increased risk of suicide (Davidson, 2000). It appears that the hippocampus is one of the main brain areas most affected in depression (Dillon & Pizzagalli, 2018) and memory deficits associated with depression can potentially be explained by hippocampal abnormalities which will be discussed later in this chapter. The literature on the effects of anxiety and depression on general memory will now be discussed. Much of the research particularly regarding depression has focused on severe cases. This thesis is examining less severe cases due to the fact that many mental health problems in the UK go undiagnosed (Open Access Government, 2019) but because the literature surrounding sub-clinical mental health problems is limited, the majority of the literature reviewed below is oriented towards more severe cases.

1.5.2. Anxiety and General Memory

Overall, research has revealed memory problems associated with anxiety (e.g., Buodo et al., 2011; Burriss, Ayers, Ginsberg, & Powell, 2008; Plana, Lavoie, Battaglia, & Achim, 2014). However, there is a very small body of research arguing that anxiety has no consistent adverse effect on any aspect of memory functioning (e.g., Kizilbash, Vanderploeg, & Curtiss, 2002) and this is supported by the Yerkes-Dodson Law (Yerkes &

Dodson, 1908). This theory proposes a U-shaped relationship between anxiety and performance, suggesting that performance increases with physiological or mental arousal but only up to a point as high levels of anxiety can result in poor performance. Indeed, the majority of research within this area has shown that anxiety can significantly impair memory performance. For example, Lucas, Telch, and Bigler (1991) found that subjects with panic disorder demonstrated overall visual memory impairment and poor visual and verbal recall compared to typical controls, although they were no different from controls in overall verbal memory or ability to concentrate. Moreover, Buodo et al. (2011) demonstrated that symptoms of PTSD, a recognised major anxiety disorder, are associated with a number of cognitive and emotional dysfunctions including attention and concentration abilities, and memory. Other studies examining PTSD have found similar results (e.g., Burriss et al., 2008; Plana et al., 2014). Furthermore, Pacheco-Unguetti, Acosta, Lupiáñez, Román, and Derakshan (2011) employed a task that assessed the efficiency of three attentional networks: orientating, alerting, and executive control. Their findings demonstrated that anxiety is related to both reduced effectiveness of the executive control network and difficulties in disengaging attention from invalid cues, even when using emotionally neutral information. The relationship between these attentional networks and anxiety may in part explain the problems in the day-to-day functioning of individuals with anxiety (Pacheco-Unguetti et al., 2011). Other research has explored the use of complex and attentionally demanding tasks. Using a letter detection task, Tallis, Eysenck, and Matthews (1991) asked a group of controls and a group of clinically anxious individuals to specify whether a target letter was present or absent on a computer screen. Whilst there was no difference between the groups when the target letter was present, the anxious group took significantly longer to make a decision when the target letter was absent (Tallis et al., 1991), suggesting that not only is the decision-making process considerably longer for anxious individuals but they seem to only attend successfully to tasks that require them to make categorically correct decisions. This finding is particularly pertinent for police identification lineups in which the police suspect may or may not be the actual perpetrator of the crime. Furthermore, research has revealed that anxiety is associated with a memory bias for emotionally valenced material. For example, it has been shown that individuals with high trait anxiety remember more negative (threat-related) material than those with medium and low trait anxiety (Eysenck & Byrne, 1994). Similarly, a study examining memory for facial emotional expressions revealed that anxious individuals exhibit a memory bias for negative versus non-negative facial emotional expressions (Foa,

Gilboa-Schechtman, Amir, & Freshman, 2000). Such findings are relevant to this thesis as one would expect witnessing a crime to be emotional, at least some of the time.

1.5.3. Depression and General Memory

With regard to depression, whilst it has been claimed that depression has no significant influence on memory performance (e.g., Grant, Thase, & Sweeney, 2001), the majority of the research suggests that it does affect cognition and memory (e.g., Austin, Mitchell, & Goodwin, 2001; Gallassi, Morreale, & Pagni, 2001; McDermott & Ebmeier, 2009). One aspect of memory that seems to be particularly affected is episodic memory which is critical for eyewitness memory. The dual-process model of memory proposes that episodic recognition memory is made up of two independent processes: familiarity (a sense of recognition in the absence of specific detail or context) and recollection (vivid reinstatement of detail and contextual features) (Yonelinas, 2001). Research has shown a specific deficit of recollection in depression, with familiarity left intact (e.g., Drakeford et al., 2010). Of particular relevance to eyewitness identification is evidence of this recollection deficit in a study using neutral face stimuli in which patients with major depressive disorder displayed significant impairments in recognition memory and recollection for neutral faces (Drakeford et al., 2010). This recollection deficit has also been shown in individuals with sub-clinical depression (Ramponi, Murphy, Calder, & Barnard, 2010) which is particularly relevant to this thesis. Furthermore, overgeneral autobiographical memory (OGM) is one of the primary memory biases associated with depression. This is the tendency for depressed individuals to have difficulty recalling specific autobiographical episodes. Instead, they tend to remember a general category of events extending over time (e.g., Williams et al., 2007). Both overgeneral memory and reduced recollection can potentially be explained by hippocampal abnormalities in individuals with depression with research demonstrating reduced hippocampal volumes in depressed adults (e.g., Dillon & Pizzagalli, 2018). This may explain why episodic memory, which relies heavily on the hippocampus, is affected in individuals with depression (Zakzanis, Leach, & Kaplan, 1998).

In fact, research has shown that low episodic memory performance should be considered a potential marker of depression. Airaksinen, Wahlin, Forsell, and Larsson (2007) defined low episodic memory performance as the sum of free and cued recalls of organisable words and, even when controlling for differences in factors such as demographics and

socioeconomics, low episodic memory performance was reliably associated with depression (Airaksinen et al., 2007). This finding is supported by McDermott and Ebmeier (2009) in their meta-analysis of depression severity and cognitive function. Their study revealed significant correlations between depression severity and cognitive performance in the areas of episodic memory, executive function, and processing speed but not visuo-spatial or semantic memory (McDermott & Ebmeier, 2009). Additional research has looked at the differences between explicit and implicit memory with regard to the effects of depression. Ellwart, Rinck, and Becker (2003) compared memory performance between severely depressed inpatients (with major depressive disorder) and healthy controls. Whilst implicit memory was unimpaired, the two groups differed in explicit memory performance with the depressed inpatients displaying greater memory deficits. This implies that memory is impaired in individuals with depression in situations during which they are required to consciously retrieve information about an event (Ellwart et al., 2003) which is of particular relevance to this thesis. Furthermore, research has demonstrated that depressed individuals exhibit a memory bias for emotionally valenced material. It appears that they remember more negative and less positive material than non-depressed individuals (e.g., Gotlib & Joormann, 2010; Mathews & MacLeod, 2005) which is similar to individuals with anxiety. Again, this is relevant to this thesis as the witnessing of a crime is likely to be emotional. The crime shown in this thesis is a distraction burglary and, whilst it is mild in nature, it nevertheless depicts a negative event.

1.5.4. Anxiety, Depression, and Eyewitness Performance

Despite their considerable prevalence rates, the impact of anxiety and depression on eyewitness memory has been scarcely explored and the findings of studies that have examined the possible effects of these mental health problems are ambiguous. In the past, studies have looked at the effects of arousal (e.g., Clifford & Hollin, 1981; Clifford & Scott, 1978) but there are limits to how far the findings of arousal studies can be generalised to a permanent state of anxiety (trait). To date, there has only been a very small number of studies that have looked at trait anxiety within an eyewitness capacity. Ridley (2003) examined the impact of trait (and state) anxiety on eyewitness memory accuracy but found no effects. However, Dobson and Markham (1992) demonstrated that individuals with high trait anxiety were unable to provide as many correct responses as those with low trait anxiety when asked to identify details of an event. The researchers provided anxious and non-anxious participants with anxiety-arousing instructions at encoding and/or retrieval. It

was found that those who were given the instructions at encoding and retrieval, and also scored high on a test for trait anxiety, were less accurate on an eyewitness task than those who scored low on the test (Dobson & Markham, 1992). Yet, Mitte (2008) showed that anxiety can play a beneficial role in the recall of threatening information. Both implicit and explicit memory biases were investigated, and an effect of anxiety on explicit memory was revealed. Explicit memory bias was examined in recognition and recall paradigms and it was found that anxiety influenced the recollection of previous experiences with anxious individuals displaying a preference for threat-related information (Mitte, 2008). With the current thesis in mind, this is significant as explicit memory is fundamental for witness recall (Girod, 2015).

The one problem with eyewitness experiments is that they do not induce the stress that would normally be experienced by those involved in crime, whether that be the victim or the witness. It is very difficult to generalise laboratory-based eyewitness experiments to real-life crimes if factors such as stress and their effects on memory performance are not understood. One study that has attempted to measure the effects of anxiety in a more real-life context was conducted by Valentine and Mesout (2008) who focused on the impact on eyewitness identification rather than memory. They tested the ability of London Dungeon visitors to identify an individual with whom they had previously encountered in the Horror Labyrinth, either via a lineup or photo identification parade. State anxiety was measured by means of subjective self-reports and through the use of a heart rate monitor which recorded participants' heart rates whilst in the labyrinth. It was found that the former was a reliable predictor of the latter; higher state anxiety was associated with a higher heart rate. The findings revealed that 75% of those who scored below the median on the state anxiety scale made accurate identifications whereas only 17% of those who scored above the median accurately identified the individual, allowing the researchers to conclude that eyewitness identification was dramatically impaired by high state anxiety (Valentine & Mesout, 2008). Similar findings have been found in studies that have examined the effects of highly intense stress on eyewitness performance. Morgan et al. (2004), for example, compared eyewitness identification performance in high and low stress conditions. In the high stress condition, participants were confronted face-to-face with an interrogator in a well-lit room for 40 minutes. In the low stress condition, participants were still challenged by an interrogator but this condition did not involve physical confrontation. It was found that participants in the high stress condition were significantly worse at correctly identifying the perpetrator than those in the low stress condition (Morgan et al., 2004).

With regard to trait anxiety, Valentine and Mesout (2008) found no effect of trait anxiety on eyewitness identification. Given that there is only a limited number of studies examining the effects of trait anxiety specifically on eyewitness performance, additional research is essential in order to gain further clarity.

Regarding depression, literature on its effects on eyewitness memory and identification is extremely limited. There is some research to suggest that individuals with depressive symptoms are able to automatically process information about the eyes which is a key area in facial recognition (e.g., Rutherford, Clements, & Sekuler, 2007) and more accurate at recognising basic and complex emotions in others (e.g., Harkness, Sabbagh, Jacobson, Chowdrey, & Chen, 2005). Findings such as these may suggest that witnesses with depressive symptoms are at an advantage due to having certain perceptual abilities. However, other research has demonstrated that individuals with depressive symptoms are less able to inhibit irrelevant negative stimuli (e.g., Goeleven, De Raedt, Baert, & Koster, 2006) and improvements in depressive symptoms are associated with enhanced identification accuracy (e.g., Rounding, Jacobson, & Lindsay, 2014). Rounding et al. (2014) conducted an eyewitness study which comprised two phases. In the first phase, they showed 173 participants twelve target faces. In the second phase (two to four weeks later), they asked the participants to identify these faces from a series of lineups. At both sessions, participants completed measures of anxious and depressive symptomatology. It was found that participants whose depressive symptomatology improved between the two phases were more accurate at correctly identifying the target faces than those whose depressive symptomatology had stayed the same or worsened (Rounding et al., 2014). Furthermore, the dual-process model of memory and overgeneral memory bias described earlier suggest that depression is associated with both reduced recognition and reduced recall; two key components of eyewitness performance.

From the studies discussed above, it is evident that the effects of anxiety and depression on eyewitness performance are ambiguous. However, there is strong evidence for the impact of both on general memory and although the research focuses on more severe cases, it nevertheless provides some insight into the potential effects of such mental health problems on eyewitness performance. Given their high prevalence rates (Mental Health Foundation, 2019b), it stands to reason that many eyewitnesses may be suffering from either anxiety or depression, or both, when they witness a crime. Consequently, further research on their capabilities is very much needed.

1.6. Eyewitness Interviewing

Interviewing witnesses is central to the success of an investigation (College of Policing, 2013a). Within the literature, a well-recognised and influential memory enhancing technique for investigative interviewing across many countries is the Cognitive Interview (CI). This method was developed after police officers and legal experts requested an effective approach that they could use to interview witnesses. It is exclusively concerned with the retrieval of information from memory (Memon & Bull, 1991) and recognised for increasing both the quantity and quality of information obtained from eyewitnesses (Fisher & Geiselman, 1992). The current interview procedure used in the UK is based on the CI (Ministry of Justice, 2011). Before it is discussed, three psychological theories of memory upon which the CI is based will be described.

1.6.1. Psychological Theories of Memory relating to the Cognitive Interview

The first theory is the Encoding Specificity Hypothesis (Tulving & Thompson, 1973) and the idea underpinning this theory is that successful retrieval depends upon the degree of similarity between the target memory trace and the retrieval environment. For a retrieval cue to be effective, it must be specifically encoded at the time of learning (Tulving & Osler, 1968). With regard to eyewitness memory specifically, this theory encourages a witness to mentally recreate the psychological and physical environment which existed at the time of the event (known as mental reinstatement of context (MRC)). Godden and Baddeley (1975) provide underpinning support with their research conducted with divers who learnt a list of words either on land or underwater. Their findings revealed that recall was enhanced when the encoding and retrieval conditions matched (Godden & Baddeley, 1975). This context-dependency effect has been replicated in other studies (e.g., Grant et al., 1998; Marian & Neisser, 2000).

The second theory is the Multiple Trace Theory (Bower, 1967) and the idea underpinning this theory is that memory traces comprise a series of coded representations and consequently there are multiple ways of accessing a memory. According to this theory, if we are unable to remember something using one technique, we may be able to access it using a different technique. We may try, for example, to remember a person's name via different techniques and this is likely to result in better recall. Regarding eyewitness memory, this may involve recalling an event from different starting points and thus

changing the temporal order. It seems that different forms of memory retrieval (schematic versus non-schematic) require a change in the temporal order of recall (reverse versus forward) in order to obtain best evidence (Geisleman & Callot, 1990). At interview, an eyewitness may be encouraged to report what happened during the event from back to front starting with the last thing that they can remember.

The third theory is the Schema Theory (Schank & Ableson, 1977). A schema is an organised structure that captures our knowledge and expectations of some aspect of the world (Bower, Black, & Turner, 1979) and can affect how we remember (Schank & Abelson, 1977). Whilst schemas are formed by our experiences, we may also have schemas for things that we have never experienced and these derive from expectations of typical everyday events (script-based knowledge) (Schank & Abelson, 1977). Such schemas fill gaps in human memory and, whilst the individual is often unaware of this process, it allows them to make sense of new concepts. Although schemas guide the encoding and retrieval of information as well as combine current and past information, the use of script-based knowledge has the potential to be problematic as a person may be unable to discriminate between remembered information and new information (Davies et al., 2008). As a result, recall performance may be hindered as a person may recall information that is different to what they actually experienced. This is particularly pertinent to eyewitness memory (Schank & Abelson, 1977) for which memory accuracy is vital.

1.6.2. Cognitive Interview

The original CI comprises four cognitive components. The first component is mental reinstatement of context (MRC) which involves the reconstruction of the physical and personal features of an event and is based on the Encoding Specificity Hypothesis (Tulving & Thompson, 1973). The witness is instructed to form a mental picture of the environment in which the event took place. They are encouraged to think about the physical aspects of the event as well as their personal mental state at the time of the event in terms of their thoughts and emotions. The second component is report everything. Here, the witness is encouraged to recall as much information as possible, including unimportant and partial details. It has been argued that this is an effective technique for two reasons: 1) because witnesses may only report what they personally consider to be relevant without an understanding of what information has investigative value and 2) because recall of partial details may lead to the subsequent recall of additional relevant information and help police

officers to piece together witness accounts (Memon & Bull, 1991). The third component is change in temporal order which is based on the Multiple Trace Theory (Bower, 1967). After an account has been provided, the witness is encouraged to recall the event again but this time in any order they wish. The rationale here is that the witness may remember additional details by recalling the event from a different starting point. The fourth component is change perspective. This technique encourages a witness to recall information from an alternative perspective in the hope that this will trigger further memory traces. Typically, this involves asking the witness to recall the event from the perspective of another person present during the event (Fisher & Geiselman, 1992) and is aimed to limit script-based recall (Schank & Ableson, 1977).

1.6.3. Enhanced Cognitive Interview

The fundamental objective underlying each of the four cognitive components of the CI is to retrieve as much detail as possible whilst at the same time preserving the quality of the information (Memon & Bull, 1991). Early research with the CI found that it was a useful investigative technique for enhancing memory in an eyewitness context by eliciting correct information but not at the cost of increasing incorrect recall (e.g., Fisher, Geiselman, & Amador, 1989; Geiselman, Fisher, MacKinnon, & Holland, 1985; Geiselman, Fisher, MacKinnon, & Holland, 1986). In 1992, Fisher and Geiselman developed the original CI by incorporating new strategies and techniques that focus on improving communication between the interviewer and the witness as well as the flow of information during the interview, and this led to the development of the Enhanced Cognitive Interview (ECI; Fisher & Geiselman, 1992). These additional techniques include: establishing rapport, explaining the aims of the interview, initiating a free report, questioning, varied and extensive retrieval, summary, and closure. The ECI provides a clear structure for the interview with each phase contributing towards the overall success of the interview.

Research has demonstrated that this interview technique is effective at increasing the amount of correct detail recalled by a witness (e.g., Rivard, Fisher, Robertson, & Hirn Mueller, 2014) and for this reason the ECI is known widely to be one of the most successful interviewing procedures for enhancing witness recall (Paulo, Albuquerque, & Bull, 2013) with different groups of witnesses, such as children (e.g., Milne & Bull, 2003; Verkampt & Ginet, 2010) and older adults (e.g., Wright & Holliday, 2006). However, there is some evidence to suggest that police officers have had difficulty implementing the procedure in

practice (e.g., Brown, Lloyd-Jones, & Robinson, 2008; Clarke & Milne, 2001; Dando, Wilcock, & Milne, 2008) and it has been argued that this may be due to the procedure being too time-consuming and demanding for many less serious crimes (e.g., Clarke & Milne, 2001; Kebbell, Milne, & Wagstaff, 1999). Dando, Wilcock, Milne, and Henry (2009) were interested in whether substantial modifications to the original CI procedure would enhance its forensic practicability but, at the same time, retain its superiority. The change perspective and change in temporal order components were excluded and comparisons were made between the modified version and the original CI model, and it was found that the modified version was just as effective as the original model. However, the modified version was significantly shorter in length and consequently less demanding for the interviewer, allowing the researchers to conclude that this version is an effective practical alternative for frontline investigators (Dando et al., 2009).

1.6.4. Eyewitness Interviewing of Vulnerable Witnesses

As briefly mentioned earlier, there is a set of recommendations known as the ABE guidance (Ministry of Justice, 2011) in England and Wales and this was developed in line with the ECI described above. The guidance outlines good practice in interviewing vulnerable witnesses and preparing them to give their best evidence. It describes vulnerable adult witnesses as "those who have a mental disorder, learning disability or physical disorder/disability that is likely to have an impact on the quality of their evidence" (Ministry of Justice, 2011, p. 28) and emphasises that, whilst having a mental health disorder does not preclude the provision of reliable evidence; there is a need to protect the witness and provide support to enable them to give their best evidence (Ministry of Justice, 2011). According to the guidance, anxious witnesses may wish to please the interviewer and provide them with information that they believe they wish to hear to compensate for loss of memory. The evidence provided by depressed witnesses may be influenced by feelings of guilt, helplessness, or hopelessness (Ministry of Justice, 2011) and so the guidance reinforces the importance of proper preparation of the witness for the interview at the initial stages prior to formal questioning (Davies & Westcott, 2018).

Furthermore, the ABE guidance suggests the use of a phased interview structure for all witnesses (Ministry of Justice, 2011). The first phase is Establishing Rapport. This phase typically involves the interviewer asking some brief neutral questions that are unrelated to the event to ensure that the witness feels comfortable and familiar with the interviewer.

According to the guidance, effective rapport can improve both the quantity and quality of recall during the interview and is therefore essential (Ministry of Justice, 2011). The second phase is Free Narrative Account. This phase typically involves the interviewer initiating and supporting an uninterrupted free narrative account of the event from the witness by means of an open-ended invitation. The guidance stresses the importance of the interviewer being confident and competent in their approach at this stage as vulnerable witnesses may be cautious of authority figures and so it is important that the witness is reassured that the interviewer can be relied upon (Ministry of Justice, 2011). The third phase is Questioning. This phase typically involves the interviewer asking suitable questions based on the information that the witness has provided during the free narrative phase with the aim of achieving further recall. The guidance recommends commencing with open-ended questions and proceeding to specific-closed questions, if necessary. The use of leading/misleading questions is discouraged (Ministry of Justice, 2011). Vulnerable adults may have limited strategies for retrieving the relevant information from their memory and it is therefore crucial that the interviewer understands this and endeavours to overcome such limitations (Milne & Bull, 2006). The fourth phase is Closing the Interview. This phase typically involves the interviewer summarising the witness's account and ensuring that the witness feels that they can add new information if they wish as this can lead to further retrieval. It is the interviewer's responsibility to ensure that the interview ends appropriately and this is especially important for vulnerable witnesses in order to ensure that they do not leave the interview feeling distressed (Ministry of Justice, 2011). The research presented in this thesis uses an ABE compatible interview.

In addition, there is a range of measures collectively known as 'special measures' that were introduced to facilitate the gathering and giving of evidence by vulnerable witnesses (Davies & Westcott, 2018; Ministry of Justice, 2011). These include: screens, live TV link, evidence in private, removal of wigs and gowns, video-recorded evidence in-chief, intermediaries, and communication aids. The decision to use a special measure(s) is based upon whether or not a witness has the capacity to provide their best evidence without assistance and the court determines which special measure(s) is most appropriate depending on the circumstance of each individual case (Smith & Tilney, 2007). There is evidence to suggest that such measures have helped witnesses to feel more confident (e.g., Burton, Evans, & Sanders, 2006) and improved witness satisfaction with the CJS (e.g., Hamlyn, Phelps, Turtle, & Sattar, 2004). In terms of the effectiveness of the ABE guidance, including special measures, there is a limited body of research to suggest that compliance

with the guidance is poor with respect to victims, such as child victims of sexual abuse (Criminal Justice Joint Inspection, 2014). However, very little literature has evaluated its effectiveness with vulnerable adults. The ABE interview is currently the standard interview protocol used with vulnerable witnesses in practice (Ministry of Justice, 2011) and will therefore be used in this thesis to explore the eyewitness capabilities of witnesses with anxiety and depression.

1.7. Eyewitness Identification

As well as relying on effective interviewing techniques, a successful investigation also relies heavily on effective lineup identification methods (Wells & Seelau, 1995). As described earlier, methods of showing lineups is a system variable that can be controlled by the CJS. In the UK, under the Police and Criminal Evidence Act 1984 (PACE), there is a code of practice (Code D) for the identification of persons by police officers which outlines two main objectives of identification procedures: 1) to test the witness's ability to identify the suspect as the person they saw on a previous occasion and 2) to provide safeguards against mistaken identification (Home Office, 2017). The code defines three main identification procedures. The first is a sequential video identification which involves the witness viewing a set of moving images of the suspect, together with similar images of others who resemble the suspect. The second is an identification parade which involves the witness viewing the suspect in a line of others who resemble the suspect. The third is a group identification which involves the witness viewing the suspect in an informal group of people. In practice, video identification is the preferred method of establishing identification in England and Wales (Davies & Griffiths, 2008). It is important to distinguish between perpetrator present (PP) and perpetrator absent (PA) lineups as comparisons are often made between the two in eyewitness research. A PP lineup includes the true perpetrator and a number of foils whereas a PA lineup comprises a perpetrator 'replacement' who closely resembles the actual perpetrator and a number of foils (Wells & Turtle, 1986). For many years, research has stressed the importance of including PA lineups in experimental designs as, in real-life cases, the true perpetrator may not be present in the lineup because the police suspect is innocent (Wells & Turtle, 1986). Consequently, it is important that eyewitness identification experiments use both PP and PA lineup conditions to ensure that the effects of experimental variables are clarified under both of these possible states (Brewer, Weber, & Semmler, 2005) and thus both lineup conditions will be used in the current thesis.

Within the legal system, eyewitness identifications play an important role with correct identifications providing major advances in criminal investigations (Wells & Loftus, 2013). Over the years, a large body of research has examined eyewitness identification procedures (e.g., Horry, Halford, Brewer, Milne, & Bull, 2014; Horry, Memon, Wright, & Milne, 2012; Wells, 1993; Wells et al., 1998). Traditionally, lineups were presented simultaneously in which the suspect and foils are presented at the same time; known as the simultaneous lineup. However, it has been argued that this type of lineup encourages the witness to make comparisons between the lineup members and subsequently base their decision on who best fits their original memory; an approach known as the relative judgement strategy (Wells, 1984; Wells & Seelau, 1995). This strategy leads to higher rates of false identifications, especially for PA lineups (Lindsay & Wells, 1985). Consequently, an alternative method of lineup presentation was put forward which involves each lineup member being presented separately; known as the sequential lineup (Lindsay & Wells, 1985). With this type of lineup, it is more difficult for the witness to make relative comparisons between the lineup members. Instead, it encourages the witness to make an absolute judgement decision as they are more likely to compare each lineup member separately with their memory for the perpetrator (Hope & Sauer, 2014). There is a large body of research to suggest that sequential presentation significantly enhances identification accuracy (e.g., Clark, Howell, & Davey, 2008; Goodsell, Gronlund, & Carlson, 2010; Kneller, Memon, & Stevenage, 2001; Lindsay et al., 1991; Steblay, Dysart, & Wells, 2011) as a result of reducing false identifications from PA lineups. However, a recent study conducted in the United States has revealed that sequential lineups are not necessarily superior to simultaneous lineups due to a reduction in positive identifications, and that the reverse is more likely to be true (Wixted, Mickes, Dunn, Clark, & Wells, 2016). Nevertheless, in the UK, video lineups presented sequentially are the principle identification procedure under PACE (1984) Code D (Home Office, 2017) and consequently video lineups will be used in the current thesis (for full details regarding the sequential presentation of PACE Code D video lineups see page 121).

1.7.1. Eyewitness Identification Performance of Vulnerable Witnesses

Within the literature, attempts have been made to explore the identification performance of vulnerable groups. For example, it has been argued that the age of the witness plays a role with research reporting that younger adults are superior to older adults in identification accuracy (e.g., Kassin, Tubb, Hosch, & Memon, 2001; Yarmey, 2001).

Studies have found that older adults (aged over 60 years) make fewer correct identifications and more false identifications on PP lineups and fewer correct rejections and more false identifications on PA lineups (e.g., Memon & Bartlett, 2002; Memon, Bartlett, Rose, & Gray, 2003; Rose, Bull, & Vrij, 2003; Searcy, Bartlett, & Memon, 1999). More recent research has revealed that older adults are worse than younger adults at identifying a young perpetrator; however, they are no worse than their counterparts at identifying an older perpetrator (Wilcock, Bull, & Vrij, 2007). In certain circumstances, it may therefore be possible for older adults to perform at an equivalent level to younger adults. Research has also been conducted with adults with ID, although the literature is very limited. The most recent study to date explored the identification performance of adults with and without ID on both a PA and a PP photo lineup, and found that adults with ID demonstrated poorer performance across both lineup types (Wilcock & Henry, 2013). In particular, those with ID made fewer correct identifications of the perpetrator and more false identifications on PP lineups, and fewer correct rejections and more false identifications on PA lineups which support the findings of previous studies (e.g., Ericson & Issacs, 2003; Ternes & Yuille, 2008). With regard to child eyewitnesses, both field and laboratory studies have shown that children are more likely than adults to make a false identification (e.g., Pozzulo & Balfour, 2006; Pozzulo & Warren, 2003). However, this error seems to be more apparent in PA lineups with studies revealing that children perform as accurately as adults in PP lineups (e.g., Pozzulo & Balfour, 2006; Pozzulo & Lindsay, 1998).

With the current thesis in mind, literature on identification accuracy and the vulnerability of mental health is extremely sparse. The only study to have explored this was conducted by Ridley (2003) who found a small improvement in identification accuracy in individuals with high state anxiety, albeit only on PP lineups. This is significant within a forensic context given that police identification lineups may or may not include the actual perpetrator and so it is crucial that a witness is able to make a correct decision on both PP and PA lineups. With regard to trait anxiety, there was no effect found of high trait anxiety on identification performance for either lineup type, suggesting that trait anxiety does not negatively impact identification accuracy. However, it is difficult to draw firm conclusions based on just one study. With this in mind, as well as the fact that there is no research examining the lineup performance of witnesses with depression, further research on mental health and its relationship with identification performance is very much needed.

1.8. Cross-Examination

When it comes to assessing the credibility of witness evidence, the method of cross-examination is often used. In a court of law, cross-examination is conducted with the purpose of challenging the credibility of a witness's original evidence in order to reveal the facts (Bettenay, Ridley, Henry, & Crane, 2014). It is a strategy employed to weaken the evidence and undermine the witness (Munkman, 1991). The advocate may seek to attack a witness on a number of grounds. They may imply, for example, that the witness is mistaken or has exaggerated or is generally a dishonest character and therefore should not be relied upon (Stone, 1995). Concerning vulnerable witnesses, it has been argued that cross-examination techniques traditionally deployed within the legal system can confuse vulnerable witnesses, reduce their ability to understand the issues, and diminish the accuracy of their testimony (Keane, 2012). Consequently, guidance has been produced in England and Wales to protect vulnerable witnesses during the criminal justice process (ABE; Ministry of Justice, 2011) and support advocates when preparing for trial in cases involving a vulnerable witness (The Advocate's Gateway, 2016). This thesis will explore the effects of cross-examination on the memory accuracy of witnesses with a sub-clinical mental health problem. Before reviewing the literature on cross-examination and vulnerability, it is important to discuss a number of psychological theories and concepts of memory that are pertinent to cross-examination.

1.8.1. Suggestibility

A concept that is particularly relevant to cross-examination is suggestibility, defined as "the influence of one person on another without his or her consent, the implanting of an idea, possessing a submissive tendency, and appealing to the unconscious" (Marcuse, 1976, cited in Ridley, Gabbert, & La Rooy, 2013, p. 2). Within a forensic context, all witnesses can be suggestible (Davies & Westcott, 2006). There are two forms of suggestibility that can impact eyewitness memory: interrogative and investigative. Whilst interrogative suggestibility arises when the individual is exposed to coercive questioning under interrogative pressure, investigative suggestibility occurs when the individual is incidentally exposed to false information about a past event (Ridley et al., 2013). At cross-examination, a witness is subjected to interrogative suggestibility which is "the extent to which, within a closed social interaction, people come to accept messages communicated during formal questioning, as the result of which their subsequent behavioural response is affected"

(Gudjonsson & Clark, 1986, p. 86). It is also important to make the distinction between immediate and delayed suggestibility. Immediate suggestibility is the "immediate acceptance of misleading information contained in a leading question" (Ridley et al., 2013, p. 86) whereas delayed suggestibility is "exposure to misleading information that is incorrectly reported in a subsequent test" (Ridley et al., 2013, p. 86).

1.8.2. Misinformation Effect

A well-known experimental paradigm in eyewitness memory research concerning suggestibility is the misinformation effect which is the idea that misleading post-event information presented during formal questioning is capable of contaminating eyewitness memory and thus the accuracy of memory recall (Loftus, 1975). The standard procedure in research for investigating the misinformation effect involves the witness being exposed to a crime event and then being questioned about the event in either a neutral way (in which no misleading questions are used) or a suggestive way (in which misleading questions are used) before their memory of the event is tested (Ridley et al., 2013). Research examining both immediate and delayed suggestibility has shown that misleading questions can significantly impair memory with witnesses often recalling details that represent the misinformation rather than the details of the actual event (e.g., Ayers & Reder, 1998; Jaschinski & Wentura, 2002; Zaragoza, Belli, & Payment, 2007). Research suggests that witnesses are more likely to integrate misleading information into their own testimony when, for example, the information is being provided by a credible expert (Williamson, Weber, & Robertson, 2013) or when the cost of disagreeing is high (Wright, Memon, Skagerberg, & Gabbert, 2009). Further research has shown that misleading information effects are more profound in vulnerable persons, such as those with ID and child eyewitnesses (e.g., Gudjonsson & Henry, 2003; Kebbell, Hatton, & Johnson, 2004; Ridley, Clifford, & Keogh, 2002).

The findings of previous studies with vulnerable groups are particularly relevant to the current thesis as it may be that vulnerable witnesses with a mental health problem also suffer the consequences of misleading information to a greater degree than typical witnesses. Whilst there has been some effort to explore the effect of misleading information on mental health, the literature is limited and the findings are mixed. Ridley (2003), for example, found an overall effect of misleading post-event information with misinformed groups being more suggestible than their counterparts. Yet, anxiety

moderated this effect with high state anxiety being associated with reductions in suggestibility, indicating that state anxiety may protect against misinformation. In contrast, trait anxiety was associated with higher levels of suggestibility (Ridley, 2003). Ridley and Clifford (2004) looked at state anxiety only and provide support for the diminished effect of state anxiety on suggestibility. Within the misinformed group, those who were exposed to state anxiety were less affected by misleading questions (Ridley & Clifford, 2004). Whilst such studies have revealed some interesting results, it is difficult to generalise the findings to trait anxiety as this differs quite considerably from state anxiety. As previous research has shown, trait anxiety in fact elicits higher levels of suggestibility (Ridley, 2003) which is in line with other studies demonstrating that misleading post-event information can contaminate memory to a greater degree in vulnerable persons (e.g., Gudjonsson & Henry, 2003; Kebbell et al., 2004; Ridley et al., 2002). However, literature on the effects of misinformation on anxiety is limited and non-existent regarding depression hence the need for further research.

1.8.3. Psychological Theories of Memory relating to Cross-Examination

There are two further psychological theories of memory that are fundamental to cross-examination. The trace decay theory of memory defines forgetting as the result of the automatic decay or fading of the memory trace and argues that memory accuracy is determined by the length of time between learning and recall rather than the influence of events that have taken place in between (Henderson, 2005). This theory has been tested in an eyewitness capacity with vulnerable groups. Henry and Gudjonsson (2004) were interested in whether the manipulation of memory trace strength in children with and without mild and moderate ID benefited those with ID to a greater degree than those without ID on an eyewitness memory task. It was revealed that the performance of those with ID was not enhanced in the stronger trace strength condition with open-ended recall; however, performance was significantly improved in this condition when closed misleading questions were used (Henry & Gudjonsson, 2004) which are typically employed at cross-examination. The cross-examination of a witness often takes place several months after their evidence has been gathered at interview (Rossetti, 2015) and consequently it is likely that their memory trace of the event will have naturally decayed. In contrast, the interference theory of memory defines forgetting as the result of certain traces interfering with the retrieval of others, causing the memory trace to be no longer accessible (Henderson, 2005). This may be ‘proactive’ when old information interferes with the

learning of new information, or 'retroactive' when new information prevents the remembering of old information (Henderson, 2005). Within an eyewitness capacity, there is a risk of interference occurring between witnessing an event and being questioned at cross-examination as new information that has entered the memory system since the event may interfere with the old memory trace of the event (retroactive interference). Both theories are pertinent to this thesis as the mock cross-examinations will be conducted several months after the evidence gathering stage and therefore interference and trace decay may play a role.

1.8.4. Cross-Examination of Vulnerable Witnesses

With regard to vulnerability and its relation to cross-examination, research has shown that cross-examining vulnerable groups can significantly influence the consistency of their evidence. Zajac, Gross, and Hayne (2003), for example, found that 75% of the children in their study, who were crucial witnesses in sexual abuse cases, altered at least one aspect of their account at cross-examination. In fact, a number of the children withdrew allegations of abuse entirely (Zajac et al., 2003). Furthermore, Turtle and Wells (1988) cross-examined a group of eight to twelve-year olds and every child provided a less accurate account at cross-examination compared to the initial interview. However, it has since been argued that the delay between initial interview and cross-examination did not represent the average delay in real court proceedings (Bettenay et al., 2014). Consequently, Bettenay et al. (2014) assessed how children with a range of cognitive abilities fared during a mock cross-examination using a representative delay of ten months. They found that 98% of all children altered at least one response from their initial interview when challenged. However, when age and memory for event details were controlled for, group differences in performance (recorded by total number of changed responses and 'resistance' to challenges) were not significant, suggesting that children with and without ID do not significantly differ in performance at cross-examination. Furthermore, it has been shown that the use of coercive questioning strategies by advocates at court can have a detrimental impact on the testimonies of individuals with learning disabilities (e.g., Kebbell, Hatton, Johnson, & O'Kelly, 2001). Indeed, this is supported by psychological research that has revealed that closed leading questions have the potential to be particularly influential for such individuals (e.g., Clare & Gudjonsson, 1993; Kebbell & Hatton, 1999). Additional research has revealed that witnesses with ID are more likely to agree with a leading question than typical witnesses (Kebbell et al., 2004) and elderly adults are significantly less

accurate than younger adults in response to cross-examination style questioning about a videotaped crime (e.g., Brimacombe, Jung, Garrioch, & Allison, 2003). However, the effects of cross-examination on mental health have not been explored.

Given that the studies outlined above clearly indicate that the cross-examination of vulnerable witnesses significantly influences the accuracy of their evidence, one may argue that the memory accuracy of witnesses with a mental health problem may also be impaired in a similar way. Yet, there is no research to date that has looked at mental health which, given previous findings with other vulnerable groups, is a concern. Consequently, this thesis will explore the effects associated with cross-examining witnesses with a sub-clinical mental health problem and whether the use of leading and misleading questions at cross-examination reveals an effect of suggestibility. The literature would suggest that those with a mental health problem may be more likely to cede to cross-examination style questioning (i.e., accept that they are wrong about their original evidence).

1.9. Perceptions of Vulnerable Witnesses

An area of research relevant to this thesis that has received interest, particularly in recent years, is perceptions of vulnerable witnesses. A large body of research has looked at juror perceptions with respect to witness testimony and suggests that mock jurors perceive those with a vulnerability to be less credible than typical witnesses (e.g., Allison, Brimacombe, Hunter, & Kadlec, 2006; Bruer & Pozzulo, 2012; Henry, Ridley, Perry, & Crane, 2011). Research has also examined legal professionals' perceptions albeit to a lesser extent (e.g., Reavey, Wilcock, Brown, Batty, & Fuller, 2016). The findings of such studies will be discussed below.

1.9.1. Perceptions of Jurors

Within the literature, jurors' perceived credibility of witness testimony has been explored with a number of vulnerable groups; one being children. Overall, research has shown that adult witnesses are perceived with more integrity than child witnesses (e.g., Bruer & Pozzulo, 2012; Newcombe & Bransgrove, 2007; Pozzulo & Dempsey, 2009) and children with ID are perceived with less credibility than typically developing children (e.g., Henry et al., 2011; Peled, Iarocci, & Connolly, 2004). Peled et al. (2004) found that the mere knowledge of a child witness having an ID can bias jurors' perceptions of the credibility of

their testimony, regardless of the quality of their witness statement. This finding demonstrates that pre-existing biases or stereotypes can influence how jurors perceive witness credibility and this is an important finding as jurors in real-life may or may not be aware that a witness has a vulnerability when asked to evaluate their evidence. However, the mock jurors in the study just described did not represent the range of individuals who are likely to be called for jury service in the UK as they were all students. As a result, Henry et al. (2011) conducted a similar study using a more representative sample. Again, it was found that mock jurors perceived the testimonies of children with an ID to be less credible than typically developing children. Yet, research conducted on adults with an ID has shown that mock jurors perceive them to be fundamentally credible, although they are reluctant to rely on their evidence (Stobbs & Kebbell, 2003). Further research with elderly adults has revealed that they are perceived as being less believable (Allison et al., 2006) and less competent but more honest (Kwong See, Hoffman, & Wood, 2001) than their younger counterparts.

The literature on juror perceptions of witnesses with a mental health problem is non-existent hence the inclusion of a juror perception study in this thesis. The current research on generic perceptions of mental health may suggest that jurors are likely to view vulnerable witnesses with a mental health problem differently to witnesses without a mental health problem. In the UK, there is a strong social stigma attached to mental health with approximately nine out of ten people with a mental health problem experiencing stigma in their lives (Corker et al., 2016). It seems that such individuals experience discrimination due to society having stereotypical views about mental health and how it affects people (Mental Health Foundation, 2019c). Research has shown that individuals with a mental health problem are perceived to be unpredictable and difficult to communicate with (e.g., Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000) and such beliefs are held by a wide range of people within society, regardless of whether they have knowledge and experience of mental health or know a person with a mental health problem (Crisp et al., 2000). In light of such research, as well as previous findings with other vulnerable groups, it would seem likely that jury eligible individuals who are members of society will hold stigmatised views of witnesses with a mental health problem and thus their perceptions of such witnesses will be negative.

1.9.2. Perceptions of Legal Professionals

On reviewing the available literature regarding legal professionals' perceptions of vulnerability, it is apparent that the body of research is small and further work is required. It seems that the majority of the research has examined the attitudes towards and perceptions of suspects rather than witnesses (e.g., Teplin & Pruett, 1992). However, there is some literature that has looked at how professionals involved with the legal system evaluate child witnesses with research revealing that police officers and psychiatrists have more belief in their capacities than judges, psychologists, prosecutors, and defense lawyers (e.g., Melinder, Goodman, Eilertsen, & Magnussen, 2004). Further research exploring child abuse cases has revealed that judges and police officers believe that children are capable of remembering and reporting details about the event but are prevented from doing so by emotional factors (e.g., Leander, Christianson, Svedin, & Granhag, 2007). Additionally, research has shown that over 50% of police officers perceive elderly adults as less accurate witnesses than younger adults (e.g., Wright & Holliday, 2005). It seems that elderly witnesses are perceived positively in cases that place emphasis on honesty but negatively when their ability to remember is accentuated (e.g., Kwong See et al., 2001). With regard to legal professionals' perceptions of mental health, the literature is limited. The findings of one study revealed that police officers perceive witnesses with a mental health disorder to be inherently less credible than those without a mental health disorder (Watson, Corrigan, & Ottati, 2004) and the findings of a more recent study found that professionals encounter difficulties in identifying witnesses with a mental health problem, unless the witness displays profound signs of mental distress (Reavey et al., 2016). This could be attributable to professionals not having sufficient knowledge of mental health or that the knowledge they do have derives mainly from media sources or their own intuition which cannot be easily measured (Reavey et al., 2016).

At present, the literature surrounding jurors' perceptions of mental health is non-existent and there is very little literature upon which to draw in order to understand the perceptions of legal professionals. As there is a large deficiency in knowledge regarding eyewitness memory of typical witnesses amongst jurors and legal professionals (Benton, Ross, Bradshaw, Thomas, & Bradshaw, 2005), one may argue that their knowledge of vulnerable eyewitness memory may be even less given that there is very little literature on vulnerable eyewitness memory capabilities. As a considerable percentage of witnesses who produce statements are deemed vulnerable (Smith & Tilney, 2007) and mental health

problems are so prevalent (Mental Health Foundation, 2019a), the likelihood of legal professionals and jurors being exposed to such witnesses is high. It is vital therefore that their attitudes and perceptions are better understood.

This thesis will initially explore how mental health is perceived by legal professionals working at various stages of the criminal justice process. It will then examine the eyewitness capabilities of witnesses with a sub-clinical mental health problem at interview, on identification lineups, and at cross-examination. Finally, it will explore how they are perceived by mock jurors.

Chapter 2

Study 1: Legal Professionals' Perceptions of Eyewitnesses with Anxiety and Depression

Abstract

In the UK, witnesses with a mental health disorder are considered to be 'vulnerable' by the Criminal Justice System and consequently a number of measures have been put in place to support such individuals during the legal process. However, it is not clear how mental health, anxiety and depression specifically, impact the accuracy and credibility of witness evidence. This study aimed to explore how legal professionals working at different stages of the legal process in England and Wales perceive witnesses with these mental health disorders, and their evidence. One hundred and thirteen legal professionals including; police officers, barristers, judges, registered intermediaries, solicitor-advocates, and a group labelled 'other' completed an online questionnaire which examined their personal perceptions of and attitudes towards vulnerable witnesses with anxiety and depression as well as their experiences of working with such witnesses. The findings revealed the extent to which professionals come into contact with witnesses with anxiety and depression, the interview procedures used with such witnesses, their perceptions of the Achieving Best Evidence guidance, their level of exposure to support and training, their level of knowledge about mental health, and whether changes should be made to ensure that the legal process is appropriate for witnesses with anxiety and depression. The implications of these findings are discussed.

2.1. Introduction

As outlined in Chapter 1, mental health is a growing public health concern (Mental Health Foundation, 2019a) and as a consequence many individuals with a mental health disorder come into contact with the CJS (Prison Reform Trust and Rethink Mental Illness, 2013). This suggests that the frequency of contact between legal professionals and witnesses with a mental health disorder is likely to be significant. As previously discussed, the ABE guidance considers such witnesses to be 'vulnerable' within the judicial system (Ministry of Justice, 2011); however, due to the fact that research on their capabilities as eyewitnesses is non-existent, professionals working closely with this group have limited knowledge of their ability to provide accurate and reliable witness testimonies (Reavey et

al., 2016). The present study focuses on anxiety and depression; two of the most prevalent mental health disorders (Mental Health Foundation, 2019b).

Before research can be conducted on the potential impact of anxiety and depression on witness accuracy, it is critical that an in-depth exploration of the perceptions of legal professionals is performed in order to gain further insight into how witnesses with a mental health disorder are regarded within the CJS. Due to a lack of robust evidence on the capabilities of such witnesses, it is possible that professionals working closely with this group view them and/or their evidence with bias. The Crown Prosecution Service (CPS) outlines that witnesses with a mental health disorder have the same right to access to justice as any other witness and prosecutors should make their decisions free from assumptions or stereotypes (Crown Prosecution Service, 2009). Presently, however, it is unclear whether the attitudes and perceptions of professionals are impartial. Furthermore, as mentioned in Chapter 1, the ABE guidance advises a number of measures to protect vulnerable witnesses when giving evidence (Ministry of Justice, 2011), yet little is known about the awareness and effectiveness of these measures with regard to their use in current practice in relation to mental health.

Within the literature, there has been some effort to explore CJS professionals' perceptions of vulnerable witnesses. Watson et al. (2004) revealed that police officers perceive witnesses with a mental health disorder to be less credible than witnesses without a mental health disorder. This study, however, only looked at schizophrenia, restricting the extent to which its findings can be applied to anxiety and depression. Furthermore, the limited literature has tended to focus solely on police officers and overlooked other CJS professions. Given that most witnesses come into contact with a range of professionals during the investigative process, it is important that the perceptions of all professionals are understood. Additionally, the majority of the current research focuses on perceptions of the suspect rather than the witness. For example, Teplin and Pruett (1992) examined police handling of suspects with a mental health disorder and the decision-making framework used to manage vulnerable suspects within the community. Again though, the extent to which findings of studies involving suspects can be extended to witnesses is restricted as suspects and witnesses are likely to have diverse experiences and behave differently within an investigation. As well as enhancing our knowledge of the attitudes and perceptions of legal professionals, it is also important to understand the level and effectiveness of current training regarding mental health. Although previous research suggests that police officers

do not receive adequate training and information about mental health in some countries such as Greece (e.g., Psarra et al., 2008), evidence relating to this issue is limited with regard to policing in England and Wales. Consequently, further investigation is required with professionals working at all stages of the legal process in England and Wales.

In terms of recent research regarding perceptions of mental health, the most relevant piece of research to date in England was conducted by Reavey et al. (2016). In their study, legal professionals including; police officers, judges, magistrates, and detectives took part in a semi-structured interview and their knowledge and experience of working with witnesses with a mental health disorder was explored. Their findings highlighted that such professionals were not equipped with adequate knowledge about mental health and how to deal with mental health disorders, particularly with regard to the production of witness statements. It was revealed that the level of knowledge was too basic and professionals were reluctant to address mental health concerns because they preferred to be personally and socially detached from the issue. Not knowing how to engage with mental health issues was a concern for a number of professionals in relation to obtaining accurate and reliable witness evidence (Reavey et al., 2016). Although Reavey and colleagues focused on perceptions of the witness, their research used semi-structured interviews and data were collected from a total of 20 participants. Whilst the purpose of a qualitative study is not usually to reach a large sample size, the present study nevertheless extends the findings of Reavey at al. (2016) through the use of an online questionnaire as this method allows for a larger and more representative sample. The main aim of the present study was to obtain a rich body of material on the perceptions, attitudes, and experiences of legal professionals working within various roles and at different stages of the CJS, e.g., police officers, barristers, judges, solicitor-advocates, and registered intermediaries. Registered intermediaries play an important role within the justice system as they support two-way communication between vulnerable adults and those professionals involved at the investigation and trial stages of a case (The Advocate's Gateway, 2019). The present study explored how often professionals come into contact with witnesses with anxiety and depression, whether they consider evidence provided by such individuals to be accurate and reliable, and how effective they believe the current measures to be in protecting vulnerable witnesses with a mental health disorder. In order to ensure that information was gathered from a variety of perspectives operating across a wide range of legal activities, data were obtained from police officers, barristers, judges, solicitor-advocates, and registered intermediaries. There was an additional group labelled 'other' consisting of

various other legal roles such as Paralegal Assistants and Police Community Support Officers (PCSOs).

2.1.1. The Present Study

Based on previous literature that has explored the perceptions of legal professionals, it was expected that the professionals completing the questionnaire in this study would hold biased perceptions of vulnerable witnesses with anxiety and depression in terms of how they perceive the accuracy and reliability of their evidence. As there is currently a lack of research on the eyewitness capabilities of such witnesses, it was hypothesised that professionals would report not having sufficient knowledge of mental health and its implications for witnesses.

2.2. Method

2.2.1. Design

An online questionnaire consisting of 61 questions was conducted over a ten-month period between July 2016 and April 2017 in England and Wales.

2.2.2. Participants

A total of 113 legal professionals completed the questionnaire on a voluntary basis (53 female, 60 male; minimum age range = 18-24; maximum age range = 55-60). The age ranges and number of participants in each range were: 18-24 *(1),* 25-34 *(31),* 35-44 *(35),* 45-54 *(30),* and 55-60 *(16).* The sample size was considered by looking at the one published study that has looked at mental health and a range of legal professions (Reavey et al., 2016) which used a sample size of 20 for a more qualitatively based study. Participants were recruited via e-mail, telephone, or social media from five police forces and one police organisation (Hampshire Constabulary, Leicestershire Police, West Midlands Police, Kent Police, Avon and Somerset Police, and the College of Policing), law firms, criminal courts, and professional organisations located across England and Wales. There were 32 police officers (8 female, 24 male), 32 barristers (16 female, 16 male), 6 judges (all male), 22 solicitor-advocates (12 female, 10 male), and 13 registered intermediaries (12 female, 1 male). During data analysis, a further group emerged labelled ‘other’ which comprised:

Crown Advocates *(2)*, Paralegal Assistants *(2)*, PCSOs *(2)*, Police Staff member *(1)*, and Witness Care Officer *(1)* (5 female, 3 male).

Police Officers. The group labelled 'police officers' comprised: Police Constables *(18)*, Detective Constables *(11)*, and Detective Sergeants *(3)*. The officers worked in the following areas of policing: Uniform General Patrol *(13),* General CID *(4),* Public Protection *(4),* Child Abuse Investigation *(3),* Crime Prevention and Problem Solving *(1),* Major Crime *(4),* Priority Crime *(1),* Serious Crime *(1),* and Specialist Operations *(1).*

Barristers, Judges, and Solicitor-Advocates. The barristers, judges, and solicitor-advocates worked in the following areas of practice: Crime *(33),* Personal Injury/Clinical Negligence *(6),* Family *(14),* Employment *(3),* Civil *(1),* Housing *(1),* Planning and Environment *(1),* Commercial *(1),* Education Law *(1),* Immigration *(1),* and Regulatory *(1).* Some worked in multiple areas of practice.

2.2.3. Materials

Online Questionnaire. Data were collected using a web-based software (Qualtrics). The questionnaire was based on previous research (Crossland, Kneller, & Wilcock, 2018) and practitioner feedback from a police officer, barrister, and registered intermediary to ensure that the questions were clear and appropriate. These individuals did not complete the questionnaire. It comprised a total of 61 close-ended and scaled-response questions measuring personal perceptions, attitudes, and experiences (see Appendix A). Close-ended questions allowed specific information to be obtained quickly and efficiently, and the majority of the questions were presented in this form. Scaled-response questions measured the intensity of attitudes towards vulnerable witnesses with a mental health disorder. The questions were presented in the same sequence for all participants; however, some questions were omitted depending upon the individual participant as these items were irrelevant for certain professions. Additionally, the number of questions varied between participants as some items were dependent upon the responses given to previous questions (see Appendix A).

2.2.4. Procedure

Ethics. The present study was approved by the University of Winchester Ethics Committee. In order to ensure that participants did not consider themselves to be under duress, they were informed at the beginning that they had the right to withdraw from the study within 14 days with no adverse consequences (see Appendix A). If a participant wished to withdraw, they were assigned a unique four-digit identification code that acted as an identifier and this was to be used to anonymously remove their data from the study; however, this was never found to be the case. It was ensured that no names were attached to the data and only the researchers directly involved in the study had access to the data. Participant details were coded and no identifiable personal information was stored.

Completion of Questionnaire. The questionnaire took approximately 15-20 minutes to complete and followed a simple procedure for responding. At the beginning, participants were provided with information about the study in a clear and appropriate form (see Appendix A). If they were happy to take part, they were asked to give informed consent (see Appendix A). Initially, they provided demographic details such as age and gender. They were then asked questions about 1) length of time in profession in terms of number of years, 2) contact and experience in terms of how often they came into contact with and experienced situations involving witnesses with anxiety and depression, 3) witness capabilities in terms of their perceptions of how competent such witnesses were of providing accurate evidence, 4) interview procedures in terms of how such witnesses were interviewed and whether they felt the procedures were appropriate, 5) ABE guidance in terms of the appropriateness and suitability of particular aspects such as special measures, 6) support and training in terms of their level of training regarding mental health and how they perceived such training, 7) knowledge in terms of their level of understanding of mental health, 8) legal process in terms of whether they felt the process could be improved for vulnerable witnesses, and 9) witness demographics in terms of their perceptions of the demographic makeup of witnesses with anxiety and depression. Participants were debriefed at the end of the questionnaire (see Appendix A) and provided with the researcher's contact details if they wished to discuss the study further.

2.3. Results

Due to different sized groups of participants, group responses are displayed in percentages.

2.3.1. Length of Time in Profession

Initially, participants were asked how many years they had worked within their profession. The time period with the largest percentage of participants in each group was *13 to 16 years* for police officers, *more than 20 years* for barristers, judges, and solicitor-advocates, *1 to 4 years* for registered intermediaries, and *9 to 12 years* for the group labelled 'other' (see figure 2.1).

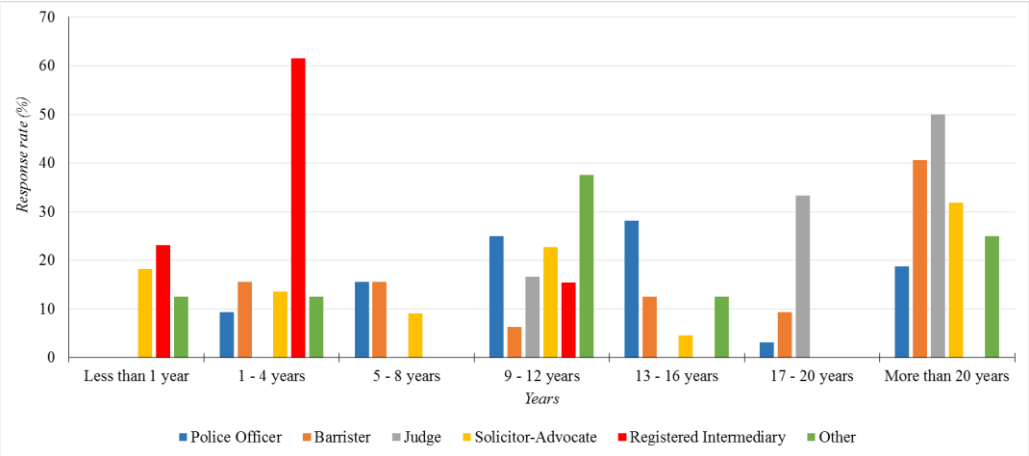

Figure 2.1. Number of years in profession

2.3.2. Contact and Experience

Participants were then asked how often they came into contact with witnesses with anxiety (see figure 2.2) and depression (see figure 2.3) within a typical month. The results show that most groups interacted with both anxious and depressed witnesses often. Witnesses with anxiety were encountered more frequently compared to witnesses with depression with *very often* and *often* being reported by all groups for anxiety only.

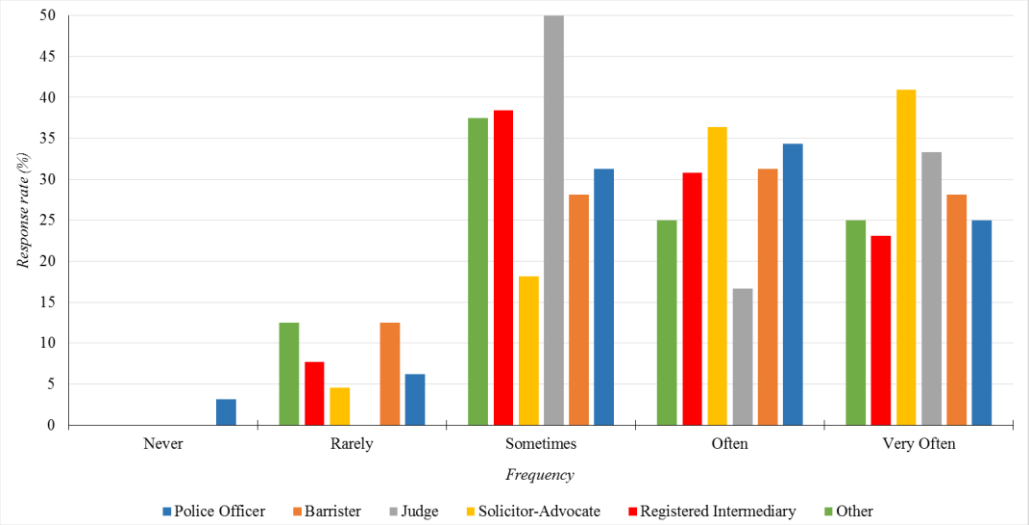

Figure 2.2. Frequency of contact with witnesses with anxiety

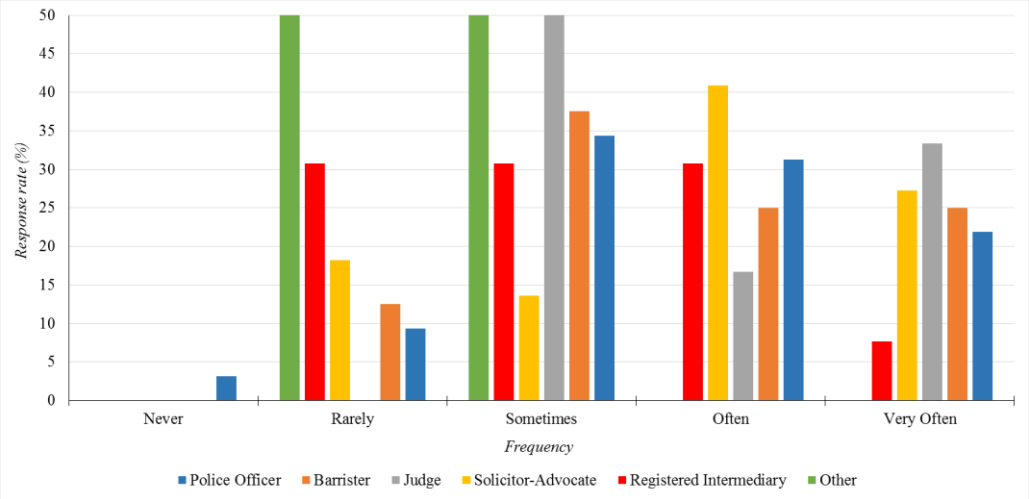

Figure 2.3. Frequency of contact with witnesses with depression

Participants were also asked how easy/difficult it was to identify witnesses with anxiety (see figure 2.4) and depression (see figure 2.5). On the whole, participants in all groups reported witnesses with depression to be more difficult to identify compared to witnesses with anxiety.

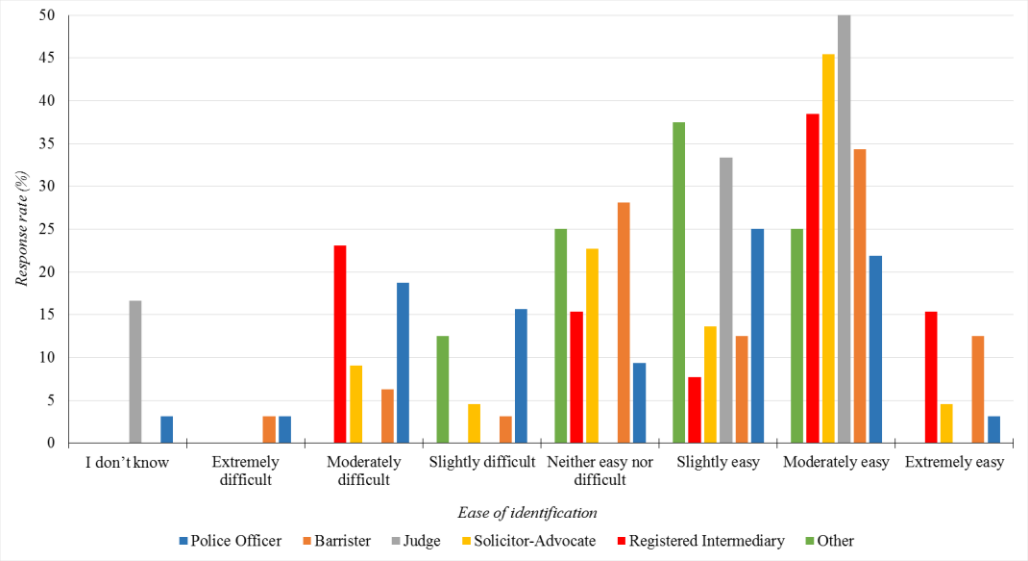

Figure 2.4. Ease of identifying anxiety

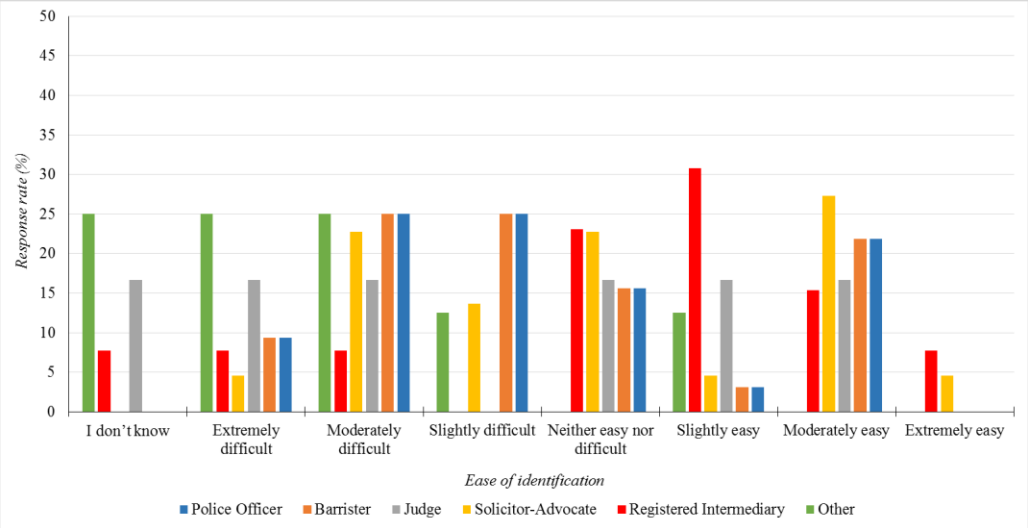

Figure 2.5. Ease of identifying depression

When asked if there were occasions when they suspected that a witness had a mental health disorder even if they had not been informed of a formal diagnosis, 94% of police officers, 97% of barristers, 100% of judges, 95% of solicitor-advocates, 100% of registered intermediaries, and 88% of the group labelled 'other' reported *yes*.

When asked how often they suspected that a witness experienced a mental health disorder, the most common response by all groups was *sometimes* (see figure 2.6). Very seldom did any group say *rarely* with only 3% of police officers, 6% of barristers, and 10% of solicitor-advocates.

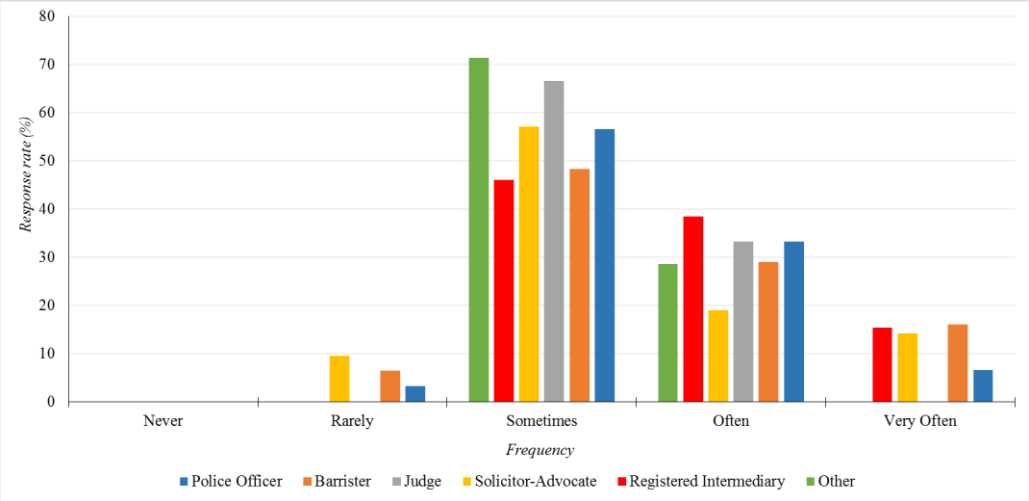

Figure 2.6. Frequency of suspected mental health cases

2.3.3. Witness Capabilities

Subsequently, participants were asked about their perceptions of the capabilities of witnesses with anxiety (see figure 2.7) and depression (see figure 2.8). When asked how capable they thought such witnesses were of providing evidence when no additional support was available, the most common response by most groups for both disorders was *moderately capable* or *slightly capable.* For anxiety, 6% of police officers, 5% of solicitor-advocates, and 23% of registered intermediaries stated *not capable at all.* However, only 3% of police officers and 3% of barristers provided this response for depression.

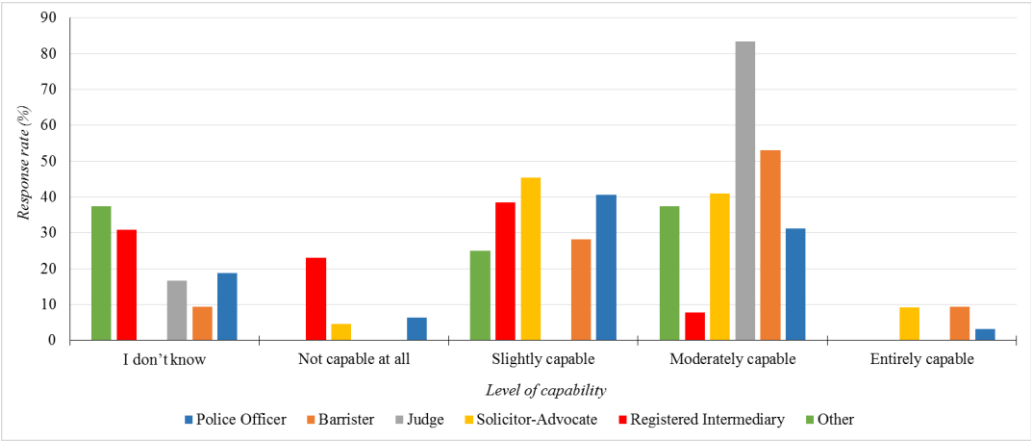

Figure 2.7. Perceived capabilities of witnesses with anxiety

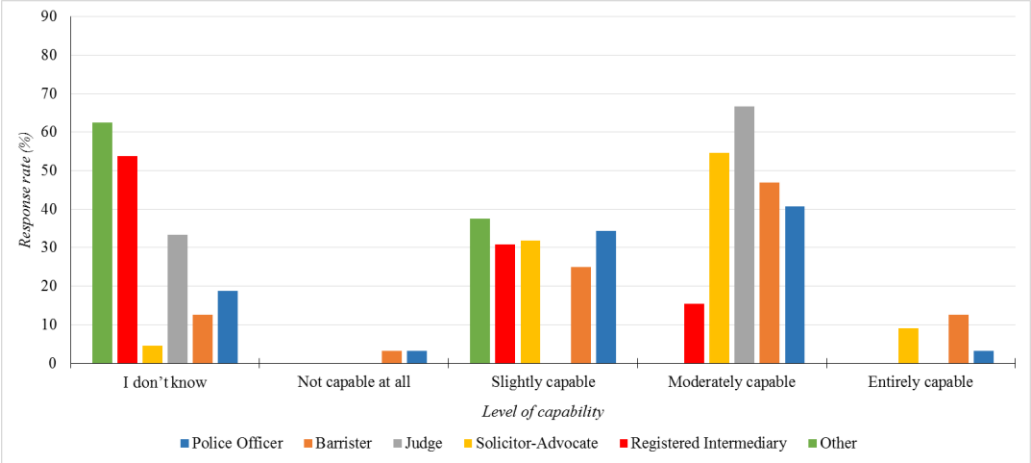

Figure 2.8. Perceived capabilities of witnesses with depression

Participants were also asked about the accuracy of evidence given by witnesses with anxiety (see figure 2.9) and depression (see figure 2.10). For both disorders, the majority of groups most commonly reported not knowing. In general, the pattern of results was similar for both cases with all groups reporting *moderately accurate* and *slightly accurate.* However, 9% of solicitor-advocates reported evidence provided by anxious witnesses to be *not accurate at all.*

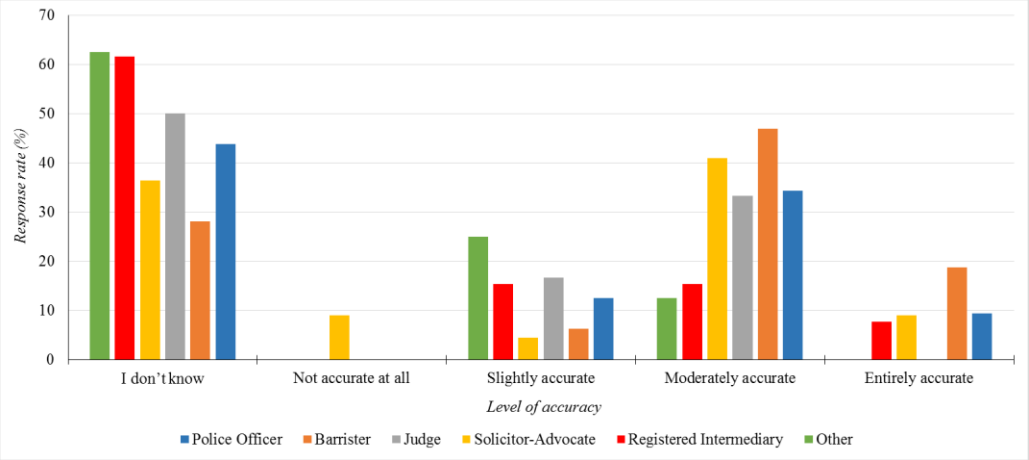

Figure 2.9. Perceived accuracy of evidence provided by witnesses with anxiety

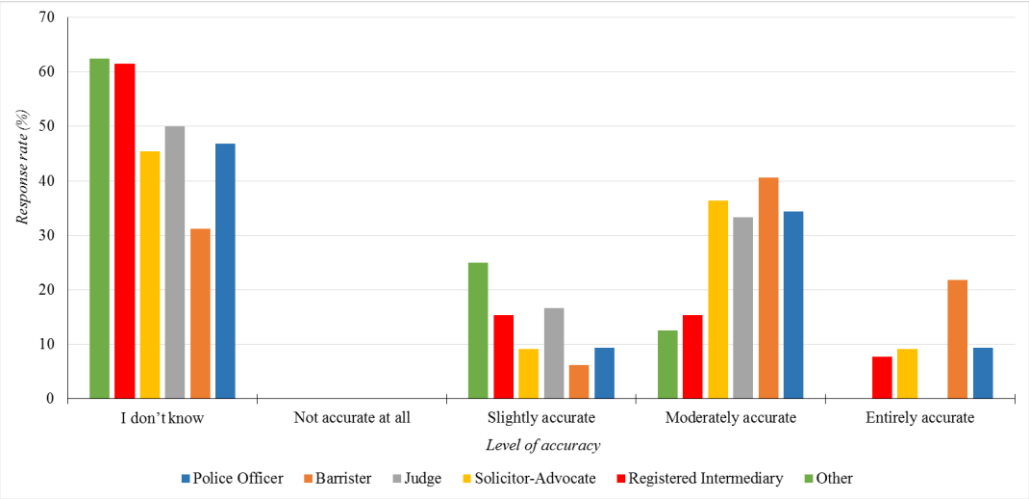

Figure 2.10. Perceived accuracy of evidence provided by witnesses with depression

Participants were then asked how able witnesses with anxiety and depression were of giving evidence in court with no additional support (see figures 2.11 and 2.12). For both disorders, the most common response was *moderately able* by barristers, judges, and solicitor-advocates, *slightly able* by police officers, and *I don't know* by the group labelled 'other'. 50% of registered intermediaries reported *slightly able* and 50% did not know. 3% of police officers, 5% of solicitor-advocates, and 23% of registered intermediaries reported that anxious witnesses were *not able at all* but only 3% of police officers and 15% of registered intermediaries reported this for depressed witnesses.

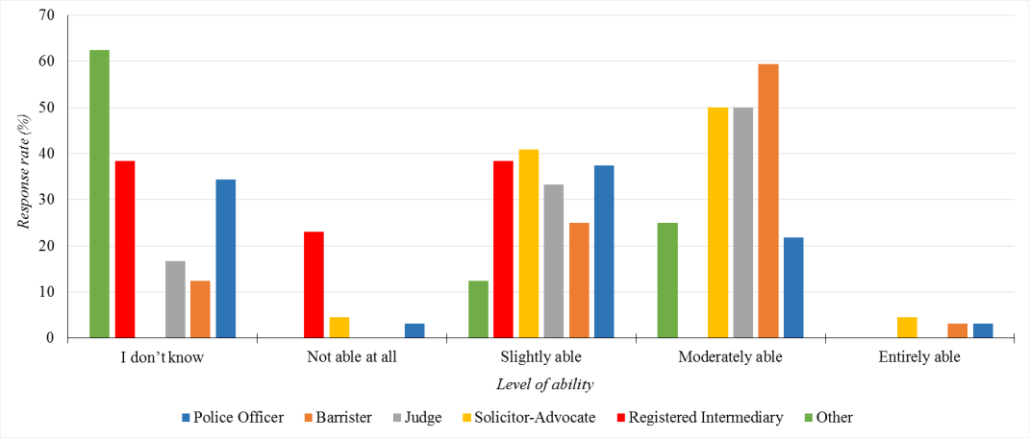

Figure 2.11. Perceived ability of witnesses with anxiety to provide evidence

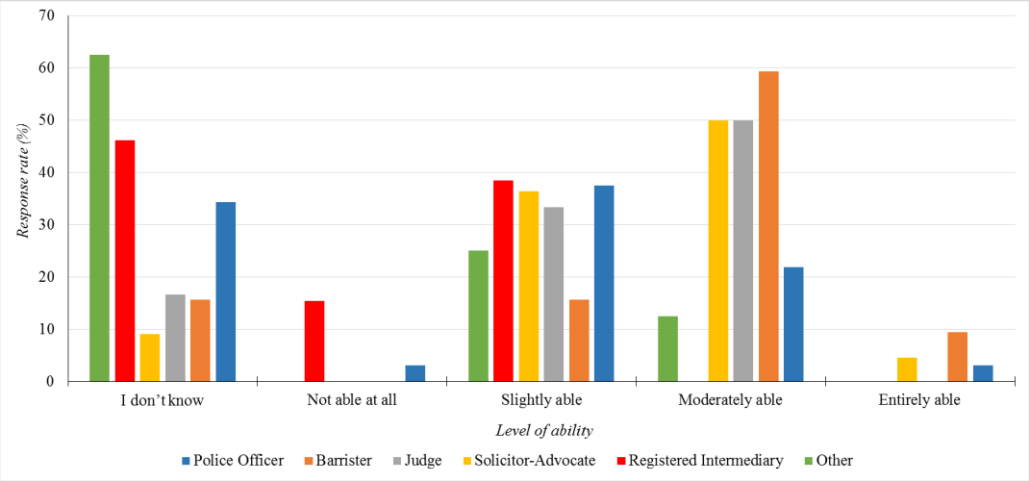

Figure 2.12. Perceived ability of witnesses with depression to provide evidence

Additionally, participants were asked how it was decided that a witness with anxiety or depression was sufficiently competent to give evidence through the use of an open-ended question. The following responses were given: *assessment by professionals* (44%), *assessment by expert witness* (4%), *use of test of competence* (8%), *use of medical assessments* (19%), *witness's own decision* (5%), *all witnesses should be considered competent* (12%), and *I don't know* (8%).

Participants were also asked about witness credibility and the results were fairly similar for both anxiety and depression (see figures 2.13 and 2.14). In general, all groups reported anxious and depressed witnesses to be credible but the degree of credibility varied. Barristers were the only group to report *not credible at all* for both disorders (3%).

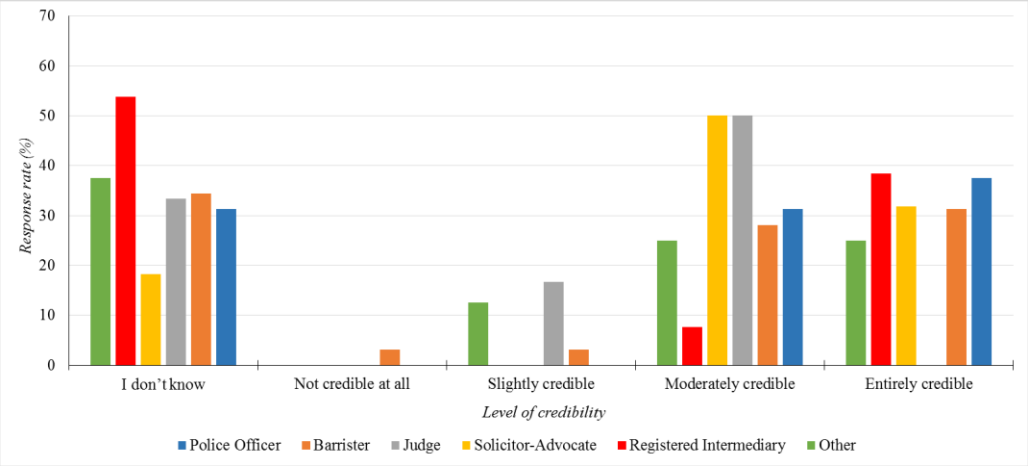

Figure 2.13. Perceived credibility of witnesses with anxiety

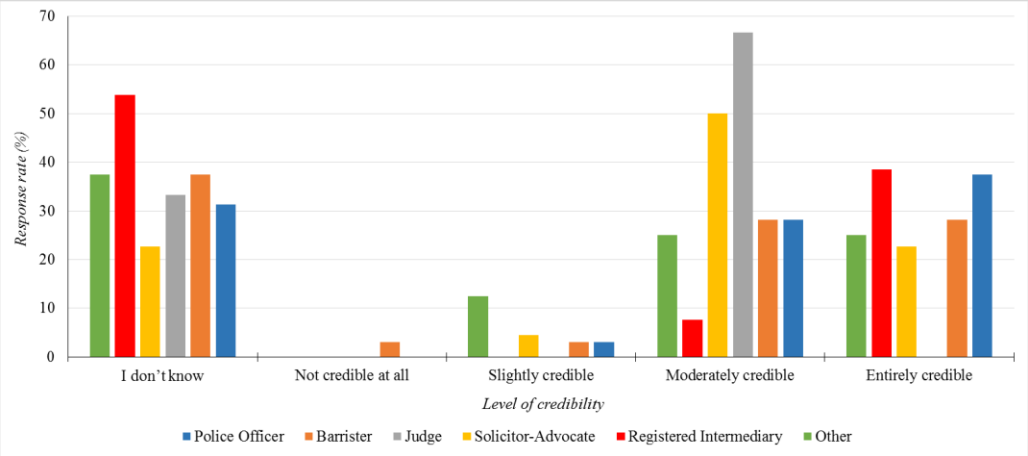

Figure 2.14. Perceived credibility of witnesses with depression

Participants were then asked whether prior knowledge of a witness's mental health disorder influenced how they perceived their evidence. The responses were fairly evenly spread across *yes* and *no* responses. 44% of police officers, 53% of barristers, 50% of judges, 41% of solicitor-advocates, 38% of registered intermediaries, and 50% of the group labelled 'other' reported *yes,* and 14% of solicitor-advocates and 15% of registered intermediaries stated *I don't know.* Those who answered *yes* were subsequently asked how

prior knowledge influenced their perceptions through the use of an open-ended question. The following responses were given: *allows decisions to be made as to whether a witness is capable of giving evidence* (15%), *provides insight into witness's behaviour* (17%), *provides insight into witness's cognitive functioning* (19%), *allows greater understanding of the needs of a witness* (17%), and *causes one to question evidence reliability* (32%).

Furthermore, participants were asked how often cases involving a witness with anxiety or depression progressed to court if there was no other evidence (see figure 2.15). The most widely held response by police officers, registered intermediaries, and the group labelled 'other' was *I don't know.* However, barristers most commonly reported *often* whilst solicitor-advocates most commonly reported *often* and *I don't know.* Judges' responses were evenly spread between *sometimes, often* and *I don't know.*

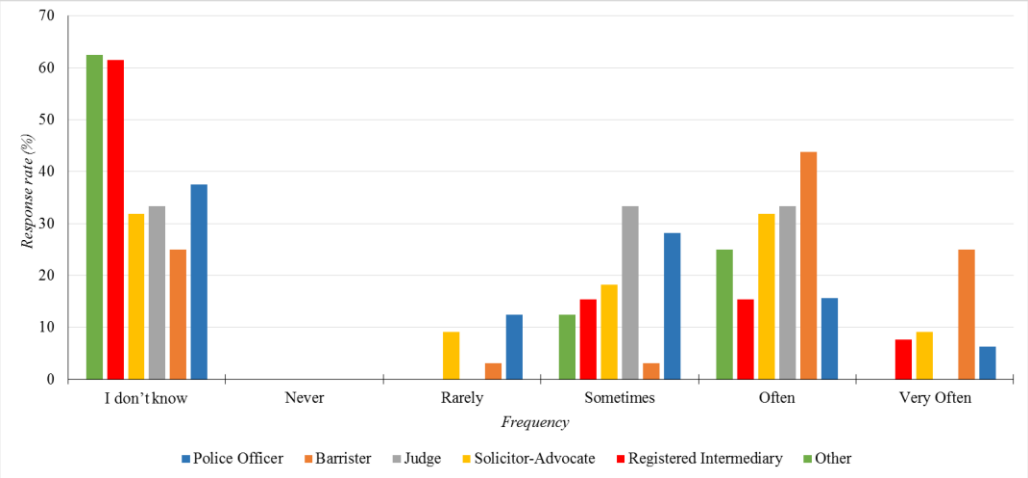

Figure 2.15. Frequency of mental health cases reaching court

The questionnaire also explored juror perceptions. Participants were asked to what extent they thought jurors found a witness with anxiety or depression to be credible (see figure 2.16). The most widely held response by most groups was *I don't know.* However, solicitor-advocates most commonly reported *moderately credible.* 9% of police officers, 13% of barristers, 17% of judges, and 9% of solicitor-advocates reported *entirely credible* and 6% of police officers and 8% of registered intermediaries reported *not at all credible.*

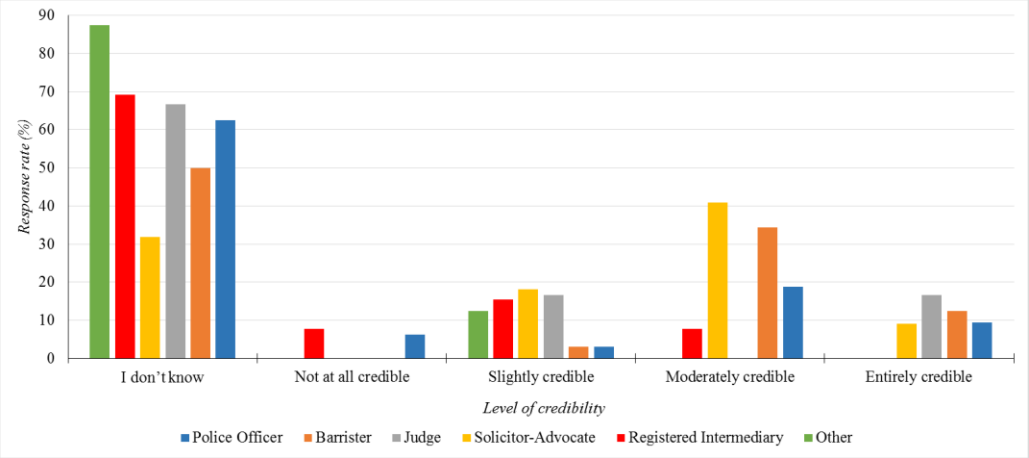

Figure 2.16. Attitudes towards jurors' perceptions of witness credibility

Additionally, participants were asked to what extent they felt that prior knowledge of a witness's mental health disorder influenced jurors' decision making (see figure 2.17). Police officers, barristers, registered intermediaries, and the group labelled 'other' most commonly reported not knowing whilst the most common response by judges and solicitor-advocates was *a moderate amount*. Barristers were the only group to report *not at all* (3%).

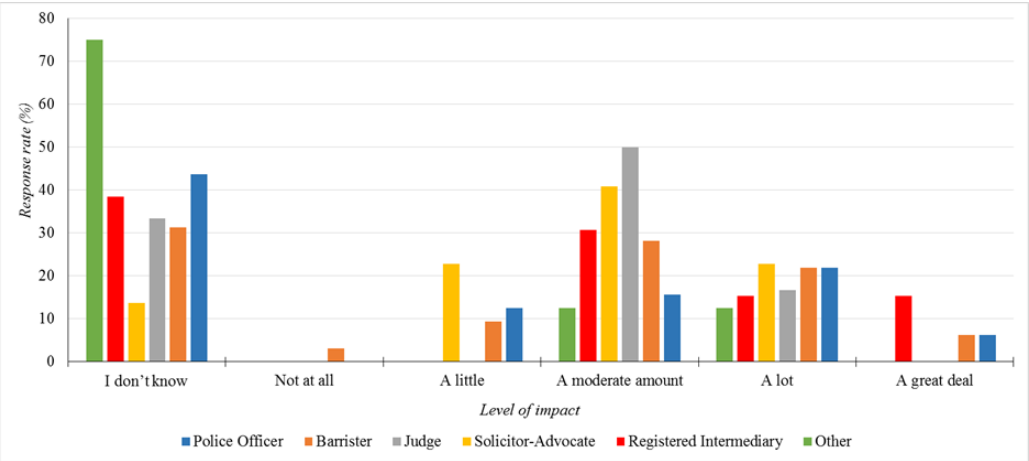

Figure 2.17. Attitudes towards the effect of prior knowledge of disorder on jurors' decision making

2.3.4. Interview Procedures

Questions relating to interview procedures were answered only by police officers, solicitor-advocates, and registered intermediaries because these groups are involved with the interviewing of witnesses. Participants were asked whether the standard procedures for interviewing witnesses with anxiety and depression were the same as, or different from, the procedures used with typical witnesses with no mental health disorders (see figure 2.18). A comparison between interview procedures used with typical and vulnerable witnesses showed a larger percentage of participants in all groups reporting the procedures to be *different.*

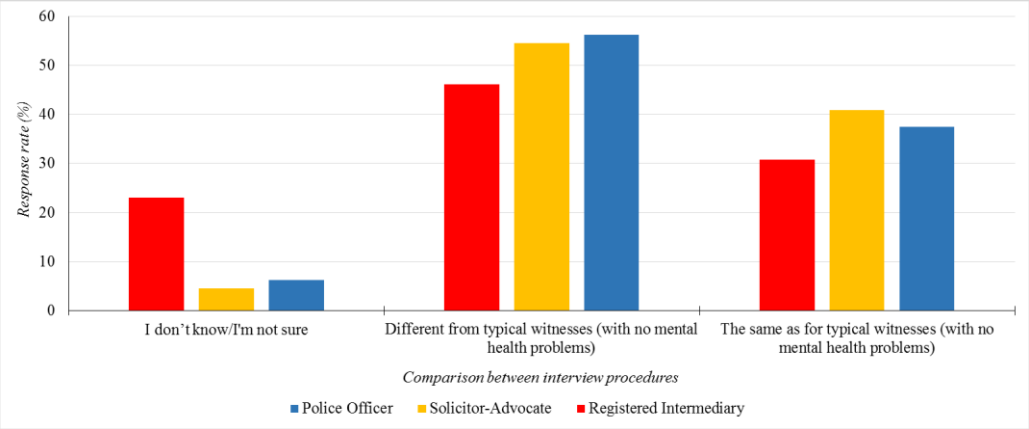

Figure 2.18. Comparison between interview procedures used with typical and vulnerable witnesses

Those who stated that the procedures were different were asked how they differed through the use of an open-ended question. The following responses were given: *use of special measures in general* (19%), *presence of a registered intermediary* (23%), *additional breaks* (4%), *presence of an appropriate adult* (17%), *use of video-recorded interview* (9%), *changes to questioning style* (11%), *additional time allocated to witness* (13%), and *presence of vulnerable witness trained officers* (4%).

All participants were then asked how effective the standard interview procedures were at obtaining useful information from witnesses with anxiety and/or depression. All groups reported the procedures to be effective but to varying degrees with 10% of police officers and 40% of registered intermediaries stating that they did not know (see figure 2.19).

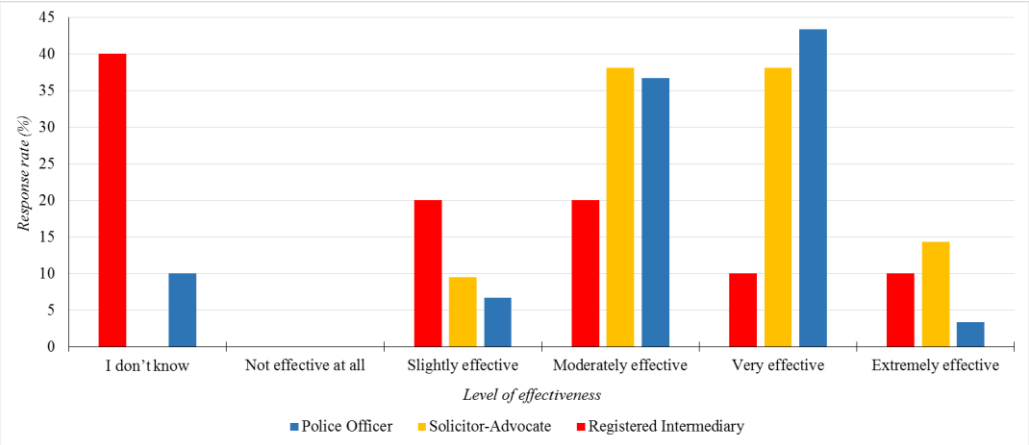

Figure 2.19. Perceived effectiveness of interview procedures used with witnesses with anxiety and/or depression

When asked if they would make any changes to how witnesses with anxiety and/or depression were interviewed, 31% of police officers, 55% of solicitor-advocates, and 85% of registered intermediaries stated *yes.* With regard to how the interview procedures could be changed, the following responses were given: *better use of ABE interview and special measures* (7%), *better questioning style* (7%), *better screening for mental health issues* (5%), *more rapport building* (12%), *allow more time for interview* (17%), *better mental health awareness training for professionals* (29%), *compulsory use of a registered intermediary* (9%), *interview to be conducted outside of police station environment* (7%), and *keep witness well informed of the process* (7%).

Subsequently, participants were asked how easy or difficult it was dealing with witnesses with anxiety and depression (see figures 2.20 and 2.21). The pattern of results is similar for both disorders in that the responses ranged from *moderately difficult* to *moderately easy*. However, 3% of police officers reported *extremely difficult* but for depression only. All

groups reported not knowing for depression but only police officers provided this response for anxiety.

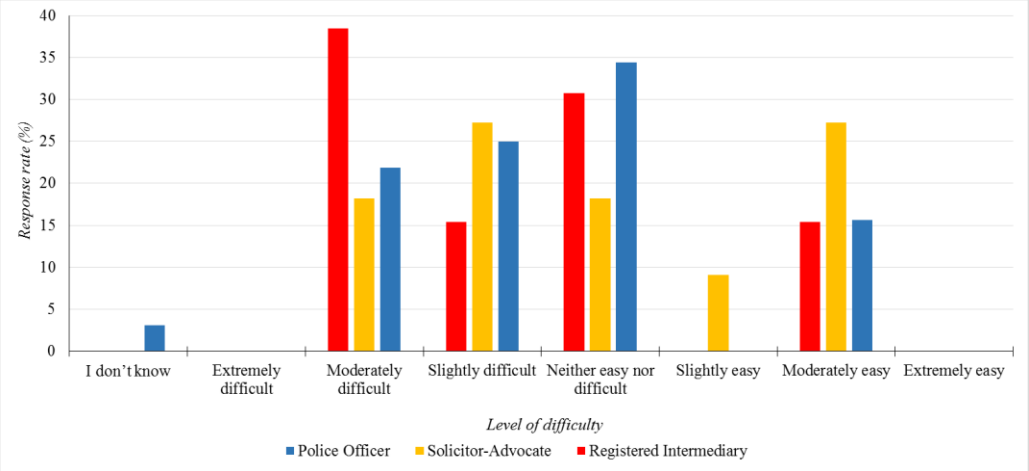

Figure 2.20. Ease of dealing with witnesses with anxiety

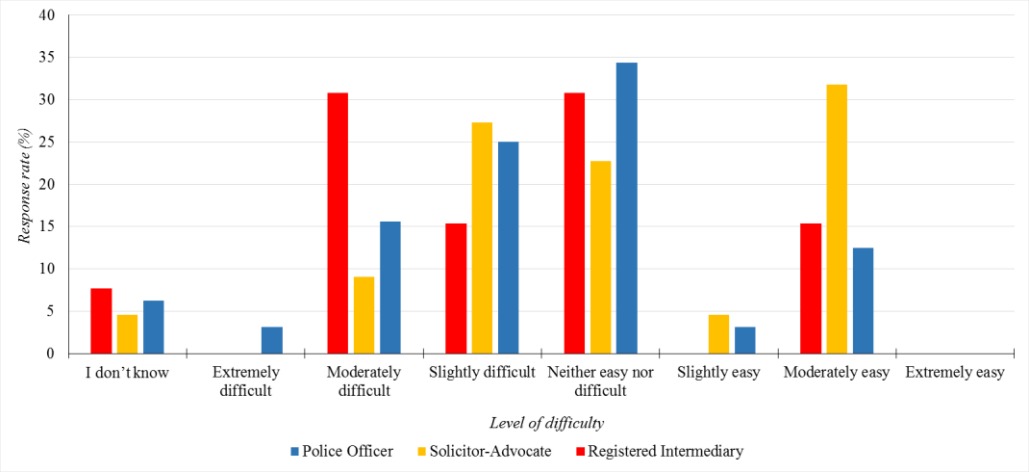

Figure 2.21. Ease of dealing with witnesses with depression

2.3.5. ABE Guidance

In order to understand how the ABE guidance was regarded, all participants were asked how appropriate it was for eliciting evidence from witnesses with anxiety and/or depression (see figure 2.22). The most widely held response by the majority of groups was *moderately appropriate* except for police officers who most commonly reported *extremely*

appropriate and the group labelled 'other' who most commonly reported *neither appropriate nor inappropriate, moderately appropriate,* and *extremely appropriate.*

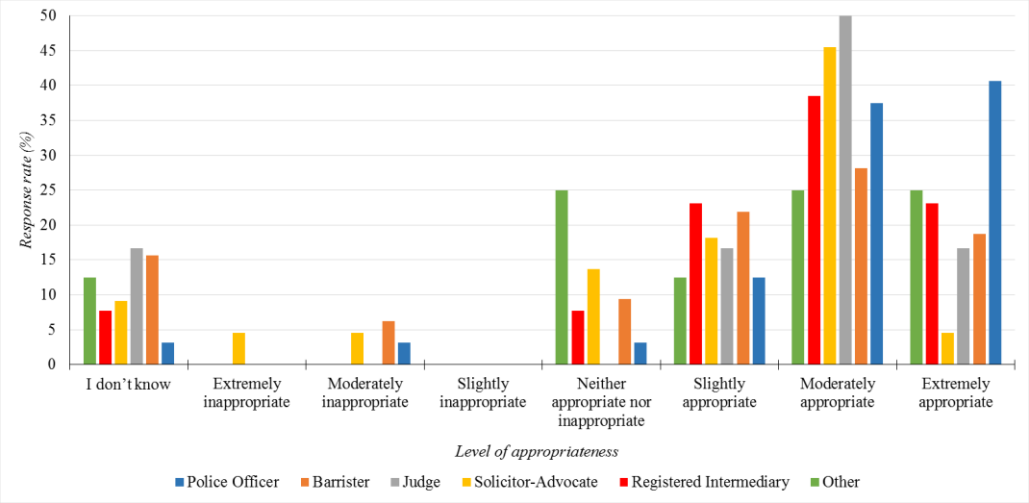

Figure 2.22. Perceived appropriateness of ABE guidance for witnesses with anxiety and/or depression

Participants were also asked how effective special measures were at supporting witnesses with anxiety and/or depression to give their best evidence (see figure 2.23). The most widely held response across groups was *moderately effective.* However, police officers also reported *very effective* to the same degree.

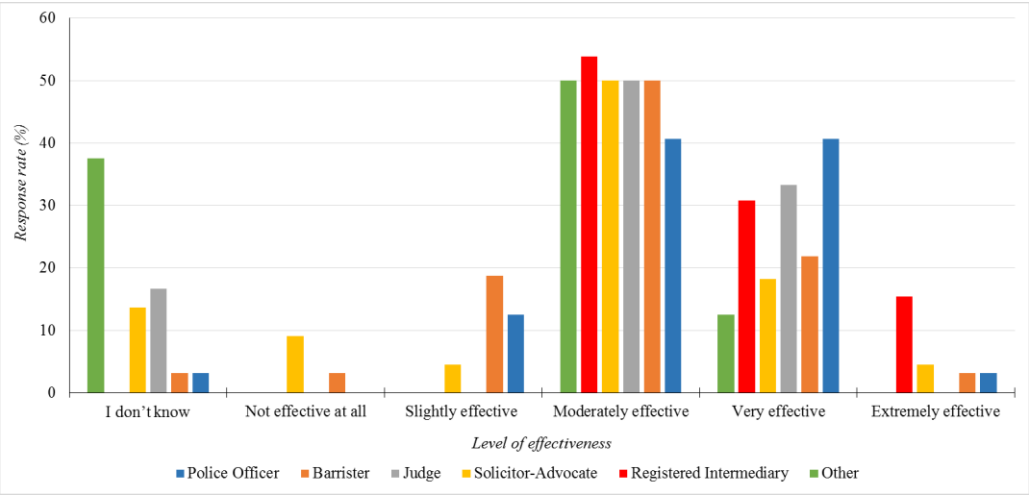

Figure 2.23. Perceived effectiveness of special measures for witnesses with anxiety and/or depression

As shown in figure 2.24, the most effective special measure commonly reported by police officers and barristers was *video-recorded interview*. However, judges reported *live link* and *screens*, solicitor-advocates reported *live link* and *video-recorded interview*, registered intermediaries reported *examination of the witness through an intermediary*, and the group labelled 'other' reported *screens, live link,* and *video-recorded interview.*

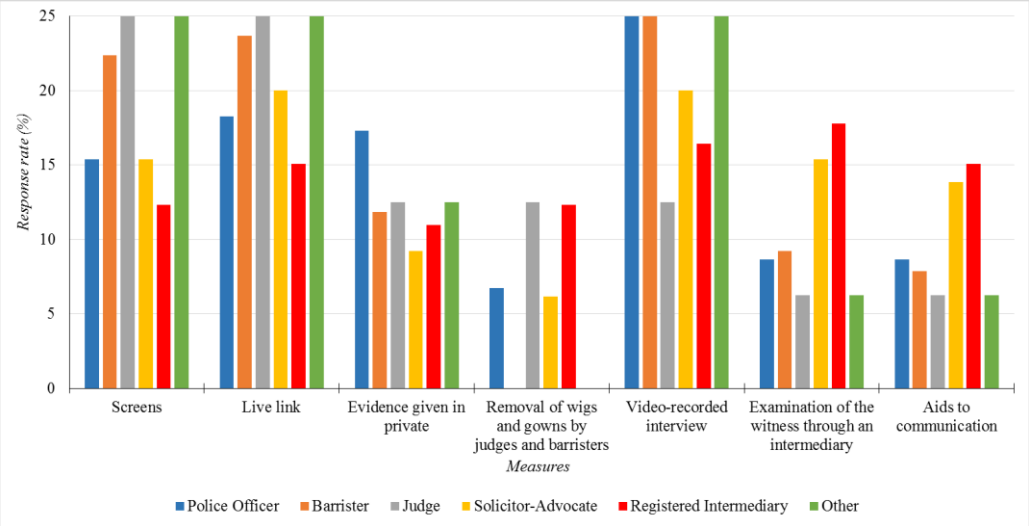

Figure 2.24. Type(s) of special measures perceived to be most effective

2.3.6. Support and Training

In addition to special measures, participants were asked if there were other types of support for witnesses with anxiety and/or depression through the use of an open-ended question. The following responses were given: *appropriate adult* (5%), *regular breaks* (18%), *supportive adult (family member/friend/support worker)* (12%), *pre-recorded cross-examination* (1%), *pre-court familiarisation visits* (22%), *therapy dogs in courtroom* (5%), *witness care/support service* (31%), and *mental health professional* (6%).

Participants were then asked if they would like to make any changes to how witnesses with anxiety and/or depression were supported. 38% of police officers, 50% of barristers, 67% of judges, 59% of solicitor-advocates, 92% of registered intermediaries, and 38% of the group labelled 'other' stated *yes.* When asked how they would change the support for such witnesses, the following responses were given: *better organisation of trial locations/dates*

(10%), *use of non-court setting for presentation of evidence* (5%), *better support services* (20%), *better identification of mental health disorder* (5%), *more appropriate questioning of witness* (3%), *better pre-trial visits* (5%), *better understanding of the issues surrounding mental health disorders* (7%), *reduce waiting times at court* (5%), *introduce witness to all advocates and court staff prior to giving evidence* (4%), *improve live-link technology* (3%), *better mental health training for legal professionals* (20%), *better communication between professionals* (3%), *pre-recorded evidence and cross-examination* (7%), and *more support from mental health specialists* (3%).

In terms of training, participants were asked if there was mental health awareness training within their profession for dealing with witnesses with anxiety and/or depression. 53% of police officers, 31% of barristers, 33% of judges, 36% of solicitor-advocates, 46% of registered intermediaries, and 25% of the group labelled 'other' stated *yes* with a further 22% of police officers, 41% of barristers, 33% of judges, 27% of solicitor-advocates, 23% of registered intermediaries, and 50% of the group labelled 'other' not knowing.

Those who were aware of such training were then asked if this training was mandatory and the responses varied across professions. 53% of police officers, 10% of barristers, and 50% of judges stated *yes* with 100% of participants in the remaining groups stating *no.* The only group to report *I don't know* was police officers (18%).

Additionally, 71% of police officers, 10% of barristers, 100% of judges, 63% of solicitor-advocates, 83% of registered intermediaries, and 50% of the group labelled 'other' had completed this training. In terms of the effectiveness and relevance of training, all participants who had completed the training reported it to be effective and relevant (see figures 2.25 and 2.26). However, there were differing perceptions of the degree of its effectiveness and relevance.

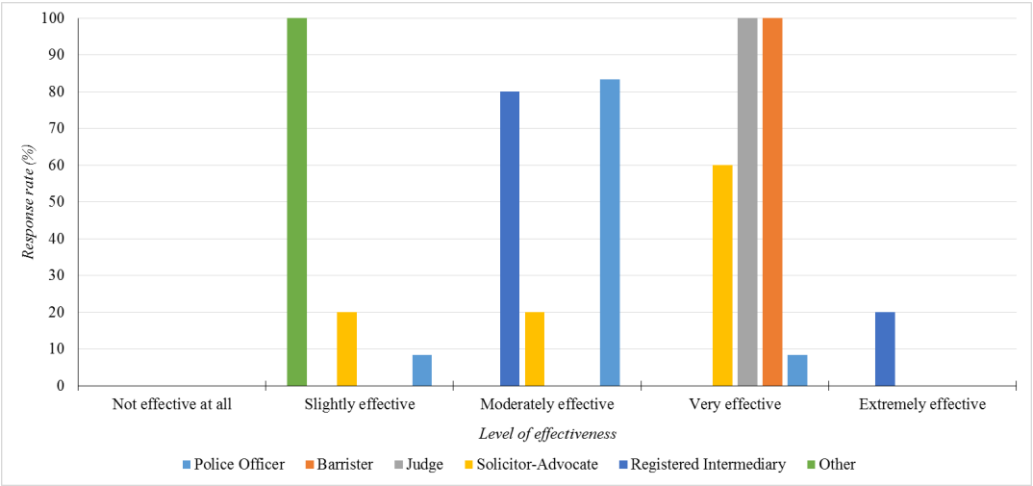

Figure 2.25. Perceived effectiveness of mental health awareness training

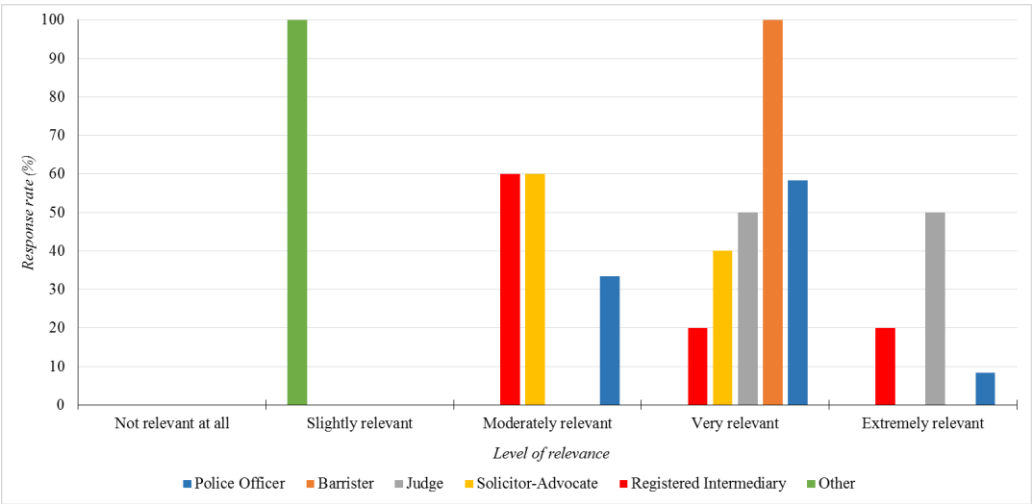

Figure 2.26. Perceived relevance of mental health awareness training

2.3.7. Knowledge

Those who had received formal mental health training were asked if they had any additional knowledge about anxiety and/or depression. 50% of police officers, 100% of barristers, 100% of judges, 80% of solicitor-advocates, 80% of registered intermediaries, and 100% of the group labelled 'other' reported *yes.*

Those who had not received formal training were asked if they had any knowledge about these specific disorders. 90% of police officers, 94% of barristers, 100% of judges, 94% of

solicitor-advocates, 100% of registered intermediaries, and 86% of the group labelled 'other' reported *yes.*

All participants with knowledge of anxiety and/or depression were subsequently asked about the source(s) from which they had received this knowledge (see figure 2.27). The most common response by all groups was *professional experience.*

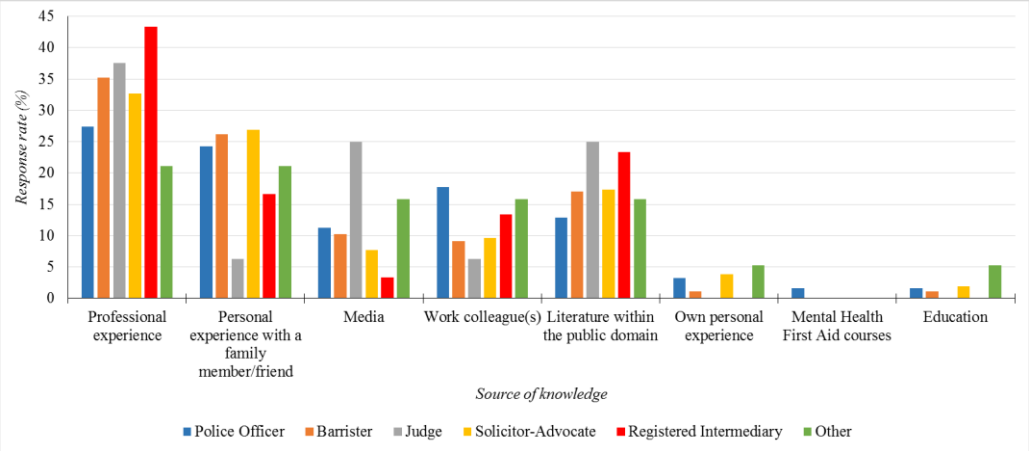

Figure 2.27. Sources from which knowledge about anxiety and/or depression derived

Participants were then asked to what extent this knowledge affected their perceptions of witnesses with anxiety and/or depression (see figure 2.28). All participants in all groups reported it to have impacted on their perceptions but to varying degrees.

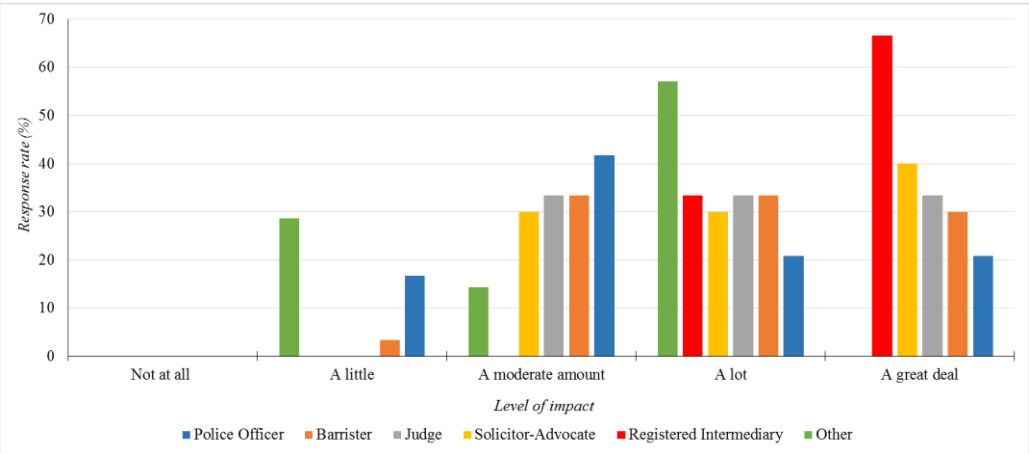

Figure 2.28. Extent to which knowledge affected perceptions of witnesses with anxiety and/or depression

2.3.8. Legal Process

Participants were asked if there was anything that they felt could be changed in the future in order to improve the legal process involving witnesses with anxiety and/or depression. 63% of police officers, 59% of barristers, 50% of judges, 68% of solicitor-advocates, 85% of registered intermediaries, and 50% of the group labelled 'other' reported *yes.*

When asked which aspects could be changed, the most common response by barristers, solicitor-advocates, and the group labelled 'other' was *general training about mental health.* However, police officers most commonly reported *specific training relating to individual mental health conditions* and *general support for vulnerable witnesses.* Registered intermediaries most commonly reported *general training about mental health* and *specific training relating to individual mental health conditions* (see figure 2.29).

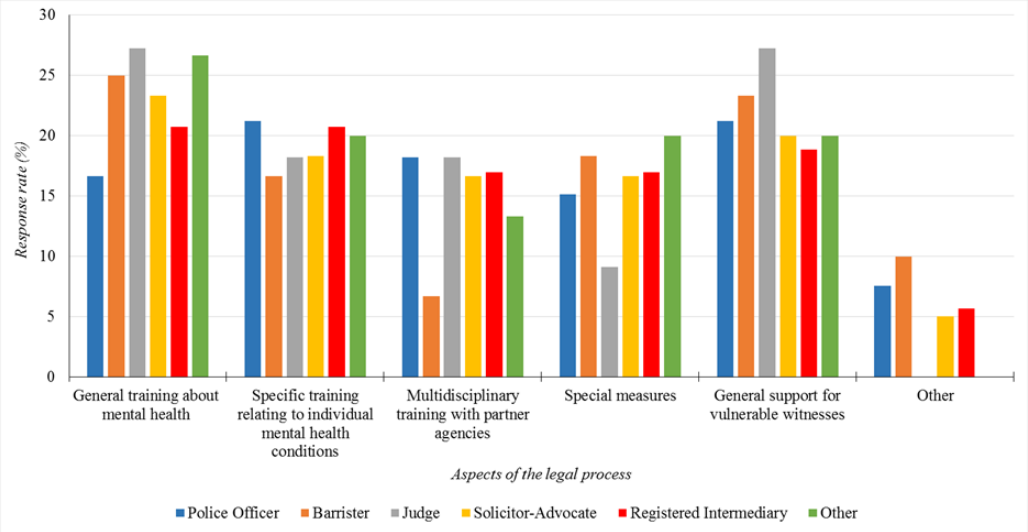

Figure 2.29. Aspects of the legal process believed to need change

Participants also had the option to select 'other' and the following responses were provided under this category: *understanding of professionals, directions to a jury if issue is raised in court, disclosing mental health issue to judge and legal professionals, disclosing*

mental health issue to jury, public awareness, better management of court dates and times, more funding, and *changes to the adversarial nature of the criminal justice process.*

2.3.9. Witness Demographics

Finally, participants were asked to describe the demographics that they felt were most likely to represent witnesses with anxiety and depression. These included: gender, age, ethnicity, and socioeconomic status. Overall, participants did not feel that anxiety or depression were more or less likely to be present in any particular gender, age, ethnic, or socioeconomic group.

2.4. Discussion

This is the first questionnaire study to explore how legal professionals in England and Wales perceive the evidence of vulnerable witnesses with anxiety and depression. The study explored the extent to which professionals come into contact with witnesses with anxiety and depression, the interview procedures used with such witnesses, their perceptions of the ABE guidance, their level of exposure to support and training, their level of knowledge about mental health, and whether changes should be made to ensure that the legal process is appropriate for witnesses with these disorders. The decision to collect data from five legal professions was based on the fact that the limited research exploring this issue previously has largely looked at police officers only (Watson et al., 2004) and disregarded other key professions that are also involved in the investigative process such as barristers, judges, solicitor-advocates, and registered intermediaries.

The results of the present study revealed that, in a typical month, professionals in all groups came into contact with both witnesses with anxiety and witnesses with depression. The majority of responses ranged from sometimes to very often and this finding is in line with previous research which has found that police officers have greater contact with individuals with a mental health disorder due to more mental health related issues within the community (Lamb, Weinberger, & DeCuir Jr, 2002) and a rise in community living for individuals with mental health difficulties (Reavey et al., 2016). Additionally, research conducted in 2007 found that more than 50% of witnesses who provided statements were deemed vulnerable (Smith & Tilney, 2007) and this is likely to be even greater today for the reasons outlined above. It is somewhat unsurprising therefore that professionals in the

present study reported frequent interactions with witnesses with anxiety and depression. Interestingly, they reported interacting with anxious witnesses more frequently than depressed witnesses which is consistent with a further finding from this study that anxiety was found to be more common than depression.

With regard to credibility, professionals on the whole perceived witnesses with anxiety and depression to be credible. This finding challenges previous literature which argues that individuals with a mental health disorder are perceived to be less credible (Watson et al., 2004). However, previous studies have tended to look solely at police officers' perceptions of witness credibility regarding mental health and so it is difficult to compare the findings to other professions. Nonetheless, when looking only at the police officers' responses to the questions about credibility in the present study, over 65% of officers reported evidence from both groups of witnesses to be either entirely or moderately credible which contradicts previous findings that police officers perceive their testimonies to be untrustworthy. Previous research within this field has also focused on other disorders, such as schizophrenia (Watson et al., 2004), and the perceptions of suspects with a mental health disorder rather than witnesses (Teplin & Pruett, 1992). The findings of such studies cannot be matched to the findings of the present study because 1) mental health disorders vary considerably and so professionals may view witness evidence differently depending upon the witness's particular disorder and 2) suspects and witnesses may be perceived entirely differently given that they have different roles within the legal process.

Moreover, a large percentage of professionals in each group reported that prior knowledge of anxiety and depression, emanating mainly from professional experience, influenced their perceptions of witnesses with these disorders. There is a lack of research on this matter currently within the literature. However, this finding is important as professionals' understanding of anxiety and depression may not be accurate and this could significantly affect how a witness's evidence is perceived in terms of accuracy and reliability. Indeed, a further finding from this study suggests this to be the case. Professionals who believed that prior knowledge of a witness's mental health disorder influenced how they perceived their evidence reported that this pre-existing knowledge caused them to question the reliability of the evidence. With regard to jury members, professionals in all groups believed that such knowledge also influenced how jury members perceived the witness's evidence. This finding is in line to a certain degree with previous research that has revealed that jurors hold negative perceptions of witnesses with learning disabilities (e.g., Stobbs & Kebbell,

2003) and ID (e.g., Peled et al., 2004). Yet, a limitation of the present study is that the findings do not allow inferences to be made with regard to how jurors themselves actually perceive such witnesses hence the inclusion of a juror perception study in this thesis.

Furthermore, it emerged from the study that more than 80% of professionals in all groups suspected that a witness had a mental health disorder even if they had not been informed of a formal diagnosis. This finding is to be expected to some extent as it appears from previous literature that a witness's vulnerability may not be disclosed until later in the investigative process, if at all (Reavey et al., 2016), which may explain the reason for professionals making their own assumptions early on. This is, however, rather concerning as such perceptions could affect how the witness is supported during the investigative process. Such findings raise the question of whether further training is required to equip professionals with the knowledge and understanding of mental health. Past research has revealed that police officers often report that they do not receive enough training and information about mental health (e.g., Psarra et al., 2008) and police training is inadequate at preparing officers for managing mental health cases (e.g., Borum, 2000). The present study supports these findings to some extent as approximately 45% of professionals in each group did not know about mental health awareness training. Yet, this finding does not suggest that the training is unavailable as it may be that professionals are just not aware of the training that is available to them. In fact, of those who knew about the training, 50% or more in most groups had completed it and all of those who had received such training felt that it was effective and relevant, albeit to varying degrees. It is difficult to compare these findings to previous literature as the majority of the research to date has focused on training for front line staff only (e.g., Borum, 2000; Lamb et al., 2002; Wells & Schafer, 2006). Interestingly though, police officers were the only group in the present study to report the training to be extremely effective which contradicts previous findings that training for police officers is inadequate (Borum, 2000). However, one may argue that there could be a sample issue with this study as the respondents to the questionnaire may have been more aware than others in their profession about mental health training.

Nevertheless, according to 31% of police officers, 55% of solicitor-advocates, and 85% of registered intermediaries, changes need to be made to the ways in which witnesses with anxiety and depression are currently interviewed. It seems therefore that improvements need to be made to the investigative interviewing of witnesses with these specific disorders. It was revealed that mental health awareness training for interviewers in

particular requires improvement. However, the present study provides support for the ABE guidance which recommends a number of measures to protect vulnerable witnesses when giving evidence and ensure that they provide reliable and credible witness statements (Ministry of Justice, 2011). Overall, most groups regarded this guidance to be appropriate for witnesses with anxiety and depression, particularly police officers. In addition, the use of special measures as a way of supporting such witnesses was held in relatively high regard by most groups and again particularly by police officers. Yet, previous research has found that very few cases involving witnesses with a mental health disorder meet the requirements for the use of special measures which are rarely used in police interviews and court (Charles, 2012). It is possible therefore that the professionals in the present study had not been exposed to the use of these measures in practice on a regular basis at the time of completing the questionnaire and so the findings must be considered with this in mind. Interestingly, a considerable percentage of professionals in each group stated that they would make changes to the current support for witnesses with a mental health disorder which suggests that the support for such witnesses is not entirely appropriate or sufficient. Specifically, professionals expressed the need for better support services and better mental health training for legal professionals.

To conclude, at least 50% of professionals in each group believed that changes need to be made in order to improve the legal process for vulnerable witnesses. A range of changes were put forward with the most common being general training about mental health, specific training relating to individual mental health conditions, and general support for vulnerable witnesses. It appears that mental health training is a key aspect of the investigative process requiring change, specifically within the context of interviewing. It is also clear that the current support for vulnerable witnesses is not satisfactory. However, before changes to the investigative process can be considered, additional research is required in order to explore the capabilities of witnesses with a mental health disorder so that we can identify their level of competency at providing accurate and reliable evidence. To date, there are no empirical studies exploring the specific psychological functioning in witnesses with a mental health disorder during the investigative process. It is vitally important that further eyewitness research is conducted with anxiety and depression specifically given that the findings of the present study have revealed a common occurrence of witnesses with these disorders. The necessity is even greater for anxiety as it has emerged that professionals encounter witnesses with this disorder more frequently, perhaps because anxiety is a more common disorder within the population (Stansfeld et al.,

2016). Further research will enable us to equip professionals with informed knowledge and reduce as much as possible prejudiced beliefs that they may have about witnesses with anxiety and depression. Having access to robust knowledge will allow professionals to understand the needs of such witnesses and put the correct support in place for them, if required, at an appropriate stage of the investigation to allow them to give their best evidence. The findings of this study provide a clear and valid justification for the study in Chapter 4 exploring the eyewitness capabilities of witnesses with a mental health problem. The next chapter (Chapter 3) describes the process involved in classifying the witness' levels of anxiety and depression prior to assessing their eyewitness performance in Chapter 4.

Chapter 3

Individual Differences

Abstract

The aim of this chapter was to classify participants' levels of anxiety and depression as well as measure their general memory functioning and degree of suggestibility. Fifty-seven adults completed a range of psychometric, memory, and suggestibility measures. The results of the psychometric measures revealed three separate groups: anxiety and depression, anxiety only, and typical (with neither anxiety nor depression). The results of the memory and suggestibility measures revealed no significant effect of group on either general memory functioning or levels of suggestibility. The implications of these findings are discussed.

3.1. Introduction

As the study in Chapter 4 is exploring the effects of anxiety and depression on witness memory and identification performance, psychometric measures were required in order to classify participants' levels of anxiety and depression. The present chapter has been included as a distinct chapter in this thesis as it was considered important to clearly outline the procedures used to measure the participants' levels of anxiety and depression prior to presenting the study in Chapter 4. Participants were allocated to the various conditions (anxiety, anxiety and depression, or typical) based on their scores on the anxiety and depression measures, and all testing was carried out individually. The anxiety measure consisted of two categories: presence of anxiety and absence of anxiety. The depression measure comprised four categories: minimal, mild, moderate, and severe depression. These will be explained in greater depth later. F-tests were conducted in order to confirm that there were differences in participants' scores on these tests in each group. The results of these tests showed that the allocation of participants to the different groups based on anxiety and depression was successful, i.e., the manipulation had worked. The State-Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), Beck Depression Inventory-2 (BDI-2) (Beck, Steer, & Brown, 1996), and Structured Clinical Interview for DSM-5 Disorders – Clinical Version (SCID-5-CV) (First, Williams, Karg, & Spitzer, 2016) were selected to classify the participants' levels of anxiety and depression. In

addition, it was necessary to measure participants' general memory functioning through standardised tests of memory. These included the Facial Memory (FM) and Memory for Stories (MFS) subtests of the Test of Memory and Learning – Second Edition (TOMAL-2; Reynolds & Voress, 2007). It was also necessary to test their level of suggestibility using the Gudjonsson Suggestibility Scale-2 (GSS-2) (Gudjonsson, 1997). The relevance of these measures will now be discussed in relation to this thesis.

With regard to the STAI, this measure includes two subscales: State Anxiety Scale and Trait Anxiety Scale (Spielberger et al., 1983). The first (state) evaluates a person's current state of anxiety using items that measure subjective feelings, such as apprehension and worry. The second (trait) evaluates relatively stable aspects of anxiety, such as general states of calmness, confidence, and security. The inventory comprises 40 items: 20 state items and 20 trait items. Whilst there are other measures available to assess a person's level of anxiety, such as the Beck Anxiety Inventory (BAI) (Beck & Steer, 1993), these measures are less appropriate for the purpose of this thesis. The BAI, for example, has a limited capacity to measure a wide range of anxiety symptoms and consequently a number of key symptoms are overlooked (Julian, 2011). Also, and more importantly, this measure does not account for the distinction between state and trait anxiety. Given that this thesis is examining the accuracy of eyewitness memory in individuals with general anxiety symptoms that are relatively fixed and remain constant across most situations, rather than the temporary changes in their emotional state, it was important to distinguish between state and trait anxiety. The STAI has the capacity to make this distinction. The current thesis aims to explore whether individuals are more susceptible to memory distortions if they display this relatively stable personality trait, irrespective of the nature of the witnessed crime, and therefore an instrument that can measure trait anxiety in isolation was essential. It is important to acknowledge that the crime situation (state) may affect individuals with trait anxiety differently to those without trait anxiety. However, the likelihood of the event itself having an effect was reduced as much as possible as the crime shown to participants in this thesis was non-violent and shown on video. The STAI has been recognised for its high degree of validity (Spielberger, 1989) and widely used in various settings including eyewitness research (e.g., Krans, Näring, Speckens, & Becker, 2011; Ridley, 2003; Ridley et al., 2002). It is simple to administer and the process of scoring and interpreting the data is neither costly nor time-consuming (Julian, 2011). Furthermore, the STAI is used for both clinical and non-clinical levels of anxiety (Ridley, 2003) and it was therefore considered an appropriate measure for the population employed in this thesis

who did not have a clinical diagnosis of anxiety. The STAI includes mean scores for working adults and university students; the two populations from which the participants in the current thesis were employed.

In terms of depression, there have been many attempts over the years to measure its symptoms and severity with different groups (e.g., Radloff, 1977; Zigmond & Snaith 1983). However, the BDI-2 (Beck et al., 1996) is one of the most widely recognised measures. It is a 21-item self-report instrument for measuring the severity of depression in adults and adolescents aged 13 years or older. It is a developed version of the original Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) which was recognised for its high internal consistency and high content validity (Richter, Werner, Heerlein, Kraus, & Sauer, 1998). The original version was also accepted for its effectiveness in distinguishing between depressed and non-depressed individuals (Richter et al., 1998) and has been used previously in eyewitness research (e.g., Ridley, 2003). It seemed therefore that the up-to-date version (BDI-2; Beck et al., 1996) was an appropriate measure to use for the purpose of this thesis.

In addition to the anxiety and depression measures described above, the SCID-5-CV (First et al., 2016) was used in this thesis to form a greater understanding of the participants' psychological functioning. The SCID-5-CV served as an additional measure to support the symptom-related data obtained from the STAI and BDI-2, allowing the researcher to identify whether a participant had more profound symptoms than those identified on the initial anxiety and depression measures. This measure has been shown to provide valid and reliable diagnostics for many DSM-5 disorders (e.g., Lancaster, Teeters, Gros, & Back, 2016). The clinical version was used in this thesis as it is a more condensed, streamlined form of the research version. Despite the 'clinician' designation, it could be used for the purpose of this thesis as anxiety and depression are amongst those included in the SCID-5-CV (First et al., 2016). It was considered appropriate for use in the current research as it was personally recommended by a clinical psychologist with experience in both a clinical and research capacity.

In order to measure participants' general memory functioning, the TOMAL-2 (Reynolds & Voress, 2007) was administered which has been used previously in eyewitness research with vulnerable witnesses (e.g., Henry, Crane et al., 2017; Henry, Messer et al., 2017). The original Test of Memory and Learning (TOMAL; Reynolds & Bigler, 1994) was introduced to

provide professionals with a standardised measure of different memory functions for children and adolescents. The second edition was introduced to extend the age range to adults up to 59 years and consequently this version was used for the current research in which it was necessary to test the memory functioning of adults. The TOMAL-2 comprises a number of different subtests; however, two subtests were adopted for the purpose of this thesis which included Memory for Stories (MFS) and Facial Memory (FM) (Reynolds & Voress, 2007). The MFS subtest was selected as participants were asked to recall details about an event which could be seen to be comparable to recalling a story. Naturally, if not prompted otherwise, individuals recall information about an event like a story from beginning to end and so it was necessary to incorporate a baseline memory measure that assessed meaningful recall. This was a verbal test during which participants recalled aloud as much information about the story as they could to the researcher. The FM subtest was selected as participants were asked to identify a perpetrator from identification lineups and therefore a measure of their memory for faces was necessary. This nonverbal subtest assessed participants' recognition and identification of faces from a set of distractors who were of various ages, both genders, and various ethnic backgrounds.

The GSS-2 (Gudjonsson, 1997) was used to obtain a baseline measure of suggestibility by assessing the extent to which participants gave in to negative feedback and leading questions (interrogative pressure). The Gudjonsson Suggestibility Scales (GSS) (Gudjonsson, 1997) were designed for a wide range of groups including individuals with mental health problems (Gudjonsson, 1997). They have been used extensively in eyewitness research (e.g., Baxter & Boon, 2000; Compo et al., 2012; Liebman et al., 2002) including studies conducted with vulnerable groups (e.g., Gudjonsson & Henry, 2003; Henry & Gudjonsson, 2003; Maras & Bowler, 2014; Ternes & Yuille, 2008). There are two scales (GSS-1 and GSS-2) and the formats are identical in structure; each comprises a verbal narrative and 20 questions about that narrative. Typically, only one of the scales is completed within the same session (Gudjonsson, 1997). The GSS-2 was selected for the purpose of the current research because it is a less complex narrative than that of the GSS-1 and consequently used more often in research involving vulnerable groups (e.g., Gudjonsson & Henry, 2003; Robinson & McGuire, 2006). The scale provides a measure of immediate memory recall, delayed memory recall, total confabulations, and total suggestibility. This test was relevant for thinking about participants' cross-examination data in Chapter 5. The method by which the scores on this test are obtained is outlined in the method section of this chapter.

3.1.1. The Present Study

The purpose of this chapter was to ascertain that participants with anxiety and/or depression obtain significantly different scores on the relevant measures to participants without such mental health problem(s). It was expected that 1) individuals with depression will obtain higher scores on the BDI-2 than their typical counterparts, 2) individuals with anxiety will obtain higher scores on the STAI than their typical counterparts, 3) individuals with both anxiety and depression will obtain higher scores on both the BDI-2 and STAI than their typical counterparts, and 4) individuals with anxiety and/or depression will obtain higher total suggestibility scores on the GSS-2 and lower scores on the FM and MFS subtests of the TOMAL-2 than their typical counterparts.

3.2. Method

3.2.1. Design

The measures described above were all administered in study 2 of this thesis (see Chapter 4). Participants were administered the STAI, BDI-2, and SCID-5-CV in the initial statement taking stage of the study and the TOMAL-2 subtests and GSS-2 in the full investigative interview stage. The SCID-5-CV was administered to all participants regardless of their scores on the STAI and BDI-2.

3.2.2. Participants

A total of 57 participants (age range = 18-48, mean age = 23.42, *SD* = 7.29) comprising 48 females and 9 males completed the measures. All participants were recruited from the local community and the University of Winchester via e-mail, telephone, research participation scheme, or participant recruitment posters.

3.2.3. Materials

State-Trait Anxiety Inventory (STAI) (Spielberger et al., 1983). The STAI consists of two scales; one for state anxiety and one for trait anxiety (see Appendix B). The questionnaire is double-sided. One side is labelled 'Y-1' and measures state anxiety, and the other side is labelled 'Y-2' and measures trait anxiety. As per the instructions, Y-1 is

administered first when both scales are given together. This is because Y-1 was designed to be sensitive to the testing conditions and therefore scores on this scale may be affected by the emotional climate that may be generated if Y-2 is administered first (Spielberger et al., 1983). Each scale comprises 20 items. The state anxiety scale includes items such as 'I feel calm' and 'I feel at ease', and participants rated the items on a 4-point scale from 1 (not at all) to 4 (very much so). The trait anxiety scale includes items such as 'I feel satisfied with myself' and 'I lack self-confidence', and participants rated the items on a 4-point scale from 1 (almost never) to 4 (almost always). A rating of 4 indicated the presence of a high level of anxiety for ten of the state items and eleven of the trait items. For the remaining ten state items and nine trait items, the scored were reversed so a rating of 4 for these items indicated the absence of anxiety. An overall score of anxiety was obtained on each scale separately by summing the scores for the 20 items. The scores on the STAI range from 20 (minimum) to 80 (maximum) (Spielberger et al., 1983). A score of 34.89 or above for males and 34.79 or above for females indicates the presence of trait anxiety.

Beck Depression Inventory-2 (BDI-2) (Beck et al., 1996). The BDI-2 consists of 21 groups of statements relating to different factors contributing to depression, e.g., 'sadness' and 'loss of pleasure' (see Appendix C). Participants selected the statement in each group that best applied to them and circled the number next to the statement to indicate their choice. If several statements within a group applied to the same extent, participants were asked to select the statement with the highest number. Each item was rated on a 4-point scale ranging from 0 to 3 and the overall score was obtained by summing the ratings for the 21 items. The scores on the BDI-2 range from 0 to 63 with scores of 0-13 representing minimal depression, 14-19 representing mild depression, 20-28 representing moderate depression, and 29-63 representing severe depression (Beck et al., 1996).

Structured Clinical Interview for DSM-5 Disorders – Clinical Version (SCID-5-CV) (First et al., 2016). A condensed version of the SCID-5-CV was used for the purpose of this thesis (see Appendix D). The full interview includes sections relating to a large number of DSM-5 disorders and consequently the majority of the questions were not relevant to anxiety and depression. Accordingly, specific sections were selected that related to anxiety disorders (e.g., 'Current Generalized Anxiety Disorder' and 'Social Anxiety Disorder') and depressive disorders (e.g., 'Current Major Depressive Episode' and 'Current Mania'). If participants answered 'no' to certain questions, it was not necessary to ask any further questions within that section and participants were moved onto the next section. For example, if they

answered ‘no’ to having a current diagnosis of agoraphobia, they were then asked questions about social anxiety disorder (see Appendix D). The SCID-5-CV was included to support and provide further insight into the baseline measures of anxiety and depression (STAI and BDI-2), if necessary.

Test of Memory and Learning-2 (TOMAL-2) (Reynolds & Voress, 2007). Two subtests of the TOMAL-2 were administered: Memory for Stories (MFS) and Facial Memory (FM) (see Appendix E). The MFS subtest comprises a total of six stories; however, each participant is administered two stories and these are selected based on their age. The age range of the participants in the current research was 18 to 48 so stories three and four were administered to those aged between 18 and 19 years and stories four and five were administered to those aged between 20 and 59 years. Participants’ recall for the first story was obtained immediately after listening to the story and the procedure was identical for the second story. The elements of the story did not have to be repeated in order and participants received one point for each element recalled correctly. The points received on both stories were summed to obtain a total raw score. The subtest instructions state that testing must be discontinued if the examinee scores 0 for the first story; however, all participants in the current research scored above 0.

The FM subtest comprises a total of seven items. On each item, participants were shown a number of stimulus pictures (faces). The number of faces shown increased on each item (item 1 = two faces, item 2 = three faces, item 3 = four faces, item 4 = five faces, item 5 = six faces, item 6 = nine faces, and item 7 = twelve faces). The number of seconds for which the faces on each item were shown also increased. For items 1-4, participants were given five seconds to view the faces. For item 5, they were given ten seconds; for item 6, they were given 15 seconds; and for item 7, they were given 20 seconds. Participants received one point for each face identified correctly and the total number of faces identified correctly provided a total raw score.

Gudjonsson Suggestibility Scale-2 (GSS-2) (Gudjonsson, 1997). The GSS-2 comprises a narrative paragraph containing a story of an event and 20 questions that are asked about the story (see Appendix F). Participants provided immediate recall which gave an indication of their attention, concentration, and memory capacity. The maximum number of ‘ideas’ that participants could recall was 40. They also provided delayed recall approximately 50 minutes after immediate recall and again the maximum number of ‘ideas’ that they could

recall was 40. For both immediate and delayed recall, an overall memory recall score was obtained by calculating the number of details recalled correctly. A total confabulations score was also obtained which included any items of information that were added to the story (fabrications) or any major alterations to the story's content (distortions). Following the delayed recall phase, participants were asked 20 questions about the story, some of which were leading. After receiving negative feedback ("You have made a number of errors. It is therefore necessary to go through the questions once more, and this time try to be more accurate"), the same questions were repeated to test for suggestibility. A number of scores were obtained. A yield 1 score referred to the number of leading questions to which participants yielded before receiving negative feedback. The maximum score that participants could obtain was 15. A yield 2 score referred to the number of leading questions to which participants yielded after receiving negative feedback and again the maximum score was 15. A shift score referred to the number of items where there was a distinct change in the participants' responses after receiving negative feedback. The yield 1 and shift scores were summed to provide an overall level of suggestibility.

3.2.4. Procedure

After taking part in the initial statement taking interview in study 2 (see Chapter 4), participants were given the BDI-2. First of all, participants were informed that their responses would be kept confidential and care was taken to ensure that they felt at ease. It was made clear to participants that if they had any questions, they should ask the researcher before completing the questionnaire. They were then given the BDI-2 record form and asked to provide their demographic details at the top of the form. Subsequently, they were asked to read the following self-administration instructions: "This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the *one* statement in each group that best describes the way you have been feeling during the past *two weeks, including today.* Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) and Item 18 (Changes in Appetite)". Once the participants had filled out the questionnaire, it was collected by the researcher and the scores were summed to provide a total score for depression.

Following the BDI-2, the STAI was administered. Again, participants were informed that their responses would be kept confidential and told to speak to the researcher if they had any questions. The researcher did not use the term 'anxiety' when administering the inventory. Instead, the term 'self-evaluation questionnaire' was used at all times. Participants were informed that there were two parts of the inventory and the researcher emphasised that the instructions were different for the two parts. They were told that they must read both sets of instructions carefully. Following this, participants were asked to complete the Y-1 form (state anxiety) first. Initially, they provided their demographic details at the top of the form. Then, they read the following self-administration instructions: "A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment.* There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best". After completing the Y-1 form, participants then completed the Y-2 form (trait anxiety). The following self-administration instructions were given: "A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel". Once the participants had completed Y-2, the inventory was collected by the researcher and the scores for each scale were summed separately to provide a total state anxiety score and a total trait anxiety score.

Following the STAI, the SCID-5-CV was administered orally. This involved a verbal interaction between the researcher and the participants during which the participants were asked a range of questions about anxiety and depression. Firstly, the researcher read the following statement aloud: "I am going to ask you some questions about anxiety and depression. I don't want to keep you here for too long so I will be quite direct at times and interrupt you if we need to move onto a new question. Please don't be offended if I do this. It is fine to give me one-word answers". Participants were then asked two initial questions to provide an indication of their mental health status which included: "Have you ever received a formal diagnosis for a mental health related difficulty and what was it?" and "Are you currently receiving treatment for a mental health related difficulty?" Subsequently, participants were asked about the following anxiety disorders: Lifetime Panic Disorder, Current Agoraphobia (past six months), Current Social Anxiety Disorder (past six months), Current Generalized Anxiety Disorder (past six months), Current Obsessive

Compulsive Disorder (OCD), and Current Post-Traumatic Stress Disorder (PTSD). They were then asked about the following depressive disorders: Current Major Depressive Episode and Current Mania. It was not always necessary to ask participants every question for each disorder. If, for example, a participant answered 'no' to the initial anxiety question relating to Lifetime Panic Disorder ("Have you ever had an intense rush of anxiety, or what someone might call a "panic attack", when you suddenly feel very frightened or anxious or suddenly developed a lot of physical symptoms?"), there was no need to continue asking questions about this disorder and the interview progressed to the next disorder. Once the SCID-5-CV had been completed, participants were thanked for their time. All participants were provided with a list of mental health organisations and available support services, such as MIND (mental health charity) and the Samaritans. For students at the University of Winchester, they were made aware of Student Services. If participants asked about any of these tests (BDI-2, STAI, or SCID-5-CV), it was made clear to them that the tests were being used for research purposes and that the researcher was not qualified to make diagnoses. If participants had any concerns, they were advised to seek help from their General Practitioner. The participants' responses to the SCID-5-CV were checked to see if more severe cases of anxiety or depression emerged.

Before taking part in the full investigative interview in study 2 (see Chapter 4), participants were informed that they would be given a short activity. The MFS subtest of the TOMAL-2 was administered. Two stories were selected based on the age of the participant. The first story was then administered and the following instructions were given: "I'm going to read you a story. Listen carefully, because when the story is done, I want you to tell the story back to me just the way you heard it. I'm going to read the first story now". The first story was then read aloud, starting with the title of the story. At the end of the first story, participants were asked to tell the story back to the researcher the very best they could. If a participant stopped at any point, the researcher encouraged them to continue by saying "tell me more" or "what else can you recall from the story?" Following this, participants were informed that they would be read a second story and to remember to tell the story back to the researcher just the way they heard it. The second story was then read aloud. At the end, participants were asked to tell the story back to the researcher the very best they could. Their scores were recorded and a total raw score (total number of elements recalled correctly from both stories) was obtained.

After the full investigative interview, participants were administered the GSS-2. They were given the following instructions by the researcher: “I want you to listen to a short story. Listen carefully because when I am finished I want you to tell me everything you remember”. The story was then read aloud clearly at a reasonably slow pace. Participants were then told the following: “Now tell me everything you remember about the story”. The narrative accounts given by the participants were audio recorded and immediate memory recall and total confabulations scores were obtained. After a delay of approximately 50 minutes during which participants completed a number of video identification lineups, they were told the following: “I am now going to read aloud the story from earlier”. The story was read aloud clearly at a reasonably slow pace for the second time. Participants were then told the following: “Now tell me everything you remember about the story”. Their narrative accounts were audio recorded and delayed memory recall and total confabulations scores were obtained. After their delayed recall, participants were told the following: “I am going to ask you some questions about the story. Try to be as accurate as you can”. Each of the 20 questions was read aloud clearly and firmly and sufficient time was given to allow participants to answer each question. It was ensured that the questions and answers could not be read by the participant. When the 20 questions had been answered, participants were given ‘negative feedback’ by being told clearly and firmly that they had made a number of errors and it was therefore necessary to go through the questions once more. They were asked to try to be more accurate and the 20 questions were then repeated. The questioning phase was also audio recorded and a number of scores were obtained (yield 1, yield 2, shift, and total suggestibility).

Following the GSS-2 questions, participants were informed that they would be given a short activity. The FM subtest of the TOMAL-2 was administered. Firstly, participants were provided with a practice item. They were given a plastic chip and the practice item was displayed. The researcher pointed at the picture and asked participants to look at it, allowing five seconds for viewing time. The page was then turned over and participants were asked to place the chip on the person they saw. In all cases, the participant gave a correct response. The researcher then continued with item 1 repeating the same instruction (“Put the chips on the faces you saw”) but no additional help was given. For each item, participants were provided with the same number of chips as faces and they were encouraged to place all chips in each case. Their scores were recorded and a total raw score (total number of faces recalled correctly for all items) was obtained. On average, the entire procedure took approximately one hour and 20 minutes.

3.3. Results

3.3.1. Baseline Measures and Condition

From the results of the psychometric measures, three groups emerged: typical, sub-clinical anxiety and depression, and sub-clinical anxiety (Table 3.1). For all groups, the SCID-5-CV did not identify any further symptoms than those identified on the STAI and BDI-2 hence why the term 'sub-clinical' has been used.

Table 3.1: BDI-2 and STAI mean scores, SD, and range across groups

	BDI-2			STAI (state)			STAI (trait)		
Group	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*
Typical	4.11	2.71	0-11	25.84	5.42	20-37	28.89	3.37	22-33
Anxiety and Depression	21.55	6.74	14-36	42.60	9.50	28-65	52.90	6.51	42-66
Anxiety	7.44	3.13	3-12	38.94	7.30	26-50	46.50	6.21	36-61

The three groups were classified according to participants' scores on the BDI-2 and STAI measures. Participants were classified as having sub-clinical depression if they obtained a score above 13 on the BDI-2 (Beck et al., 1996). The scores on the BDI-2 range from 0 to 63 with scores of 0-13 representing minimal depression, 14-19 representing mild depression, 20-28 representing moderate depression, and 29-63 representing severe depression. As per the STAI manual (Spielberger et al. 1983), both working adults and university students were classified as having sub-clinical trait anxiety if they obtained a score of 34.89 or above for males and 34.79 or above for females. Participants who obtained these scores (or above) on the STAI for trait anxiety and a score above 13 on the BDI-2 were identified as having sub-clinical anxiety and depression combined.

The typical group (mean age = 22.53, *SD* = 6.27) comprised 17 females (mean age = 22.29, *SD* = 6.31, age range = 18-43), and 2 males (mean age = 24.50, *SD* = 7.78, age range = 19-

30). The group with sub-clinical anxiety and depression (mean age = 23.70, *SD* = 8.37) comprised 17 females (mean age = 23.12, *SD* = 8.55, age range = 18-48), and 3 males (mean age = 27, *SD* = 7.81, age range = 22-36). The group with sub-clinical anxiety (mean age = 24.06, *SD* = 7.32) comprised 14 females (mean age = 23.50, *SD* = 7.73, age range = 18-44), and 4 males (mean age = 26, *SD* = 6.16, age range = 19-34). There was no effect of group (typical, sub-clinical anxiety and depression, sub-clinical anxiety) on age, $F(2, 54) = .22$, $p = .80$.

A series of one-way ANOVAs were conducted to compare the effect of group (typical, sub-clinical anxiety and depression, sub-clinical anxiety) on the cognitive measures and GSS-2. The statistical outputs for the analyses are presented in Appendix G and the mean scores, SD, and range are presented in Tables 3.1 and 3.2. An ANOVA confirmed the manipulation check was successful in that there was a significant main effect of group on STAI trait anxiety scores, $F(2, 54) = 96.59$, $p < .001$, $\eta p^2 = .78$. Post hoc comparisons using the Tukey HSD test indicated that there was a significant difference ($p < .001$) between the typical group (*M* = 28.89, *SD* = 3.37) and the group with sub-clinical anxiety and depression (*M* = 52.90, *SD* = 6.51). There was also a significant difference ($p < .001$) between the typical group (*M* = 28.89, *SD* = 3.37) and the group with sub-clinical anxiety (*M* = 46.50, *SD* = 6.21), and a significant difference ($p < .01$) between the group with sub-clinical anxiety and depression (*M* = 52.90, *SD* = 6.51) and the group with sub-clinical anxiety (*M* = 46.50, *SD* = 6.21).

An ANOVA confirmed the manipulation check was successful in that there was a significant main effect of group on STAI state anxiety scores, $F(2, 54) = 25.61$, $p < .001$, $\eta p^2 = .49$. Post hoc comparisons using the Tukey HSD test indicated that there was a significant difference ($p < .001$) between the typical group (*M* = 25.84, *SD* = 5.42) and the group with sub-clinical anxiety and depression (*M* = 42.60, *SD* = 9.50). There was also a significant difference ($p < .001$) between the typical group (*M* = 25.84, *SD* = 5.42) and the group with sub-clinical anxiety (*M* = 38.94, *SD* = 7.30). There was no significant difference ($p = .31$) between the group with sub-clinical anxiety and depression (*M* = 42.60, *SD* = 9.50) and the group with sub-clinical anxiety (*M* = 38.94, *SD* = 7.30).

An ANOVA confirmed the manipulation check was successful in that there was a significant main effect of group on BDI-2 scores, $F(2, 54) = 77.95$, $p < .001$, $\eta p^2 = .74$. Whilst the assumption of homogeneity was not met for the effect of group on BDI-2 (see Appendix G),

there was no need to transform the data as the sample sizes were not vastly different (Blanca, Alarcón, Arnau, Bono & Bendayan, 2017; Field, 2018). Post hoc comparisons using the Tukey HSD test indicated that there was a significant difference ($p < .001$) between the typical group ($M = 4.11$, $SD = 2.71$) and the group with sub-clinical anxiety and depression ($M = 21.55$, $SD = 6.74$). There was also a significant difference ($p < .001$) between the group with sub-clinical anxiety and depression ($M = 21.55$, $SD = 6.74$) and the group with sub-clinical anxiety ($M = 7.44$, $SD = 3.13$). There was no significant difference ($p = .08$) between the typical group ($M = 4.11$, $SD = 2.71$) and the group with sub-clinical anxiety ($M = 7.44$, $SD = 3.13$).

There was no significant main effect of group on Memory for Stories, $F(2, 54) = 2.64$, $p = .08$, Facial Memory, $F(2, 54) = 0.22$, $p = .80$, or suggestibility, $F(2, 54) = 0.17$, $p = .85$.

Table 3.2: MFS, FM, and GSS-2 mean scores, SD, and range across groups

		MFS			FM			GSS-2		
Group	*N*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*
Typical	19	32.58	7.87	12-44	34.42	4.46	22-40	3.42	3.96	0-15
Anxiety and Depression	20	28.20	7.57	16-47	34.35	3.08	28-39	4.00	3.64	0-13
Anxiety	18	33.72	8.23	15-46	33.72	2.68	30-40	4.11	4.19	0-14

3.4. Discussion

When interpreting the results of the analyses that explored individual group differences on the baseline measures, a number of expected findings emerged. Firstly, the STAI scores (state and trait) for the groups with sub-clinical anxiety and depression and sub-clinical anxiety were significantly higher than those for the typical group. This was anticipated as these groups were classified as having anxiety whereas the typical group was not. Secondly, the BDI-2 scores for the group with sub-clinical anxiety and depression were significantly higher than those for the typical group and the group with sub-clinical anxiety.

Again, this was predicted as the group with sub-clinical anxiety and depression was the only group to be classified as having depression. However, some unexpected findings also emerged from the analyses. There was a significant difference revealed between the group with sub-clinical anxiety and depression and the group with sub-clinical anxiety with regard to scores of trait anxiety. One would expect the levels of trait anxiety to be the same for both groups, which was the case for state anxiety, given that both groups were classified as having trait anxiety. The STAI-trait scores were significantly higher for the group with sub-clinical anxiety and depression, suggesting that individuals with both anxiety and depression combined are characteristically more anxious. Yet, there is no research to support this suggestion. Furthermore, a depression only group did not emerge from the results of the psychometric measures. This could be due to the fact that the prevalence rate amongst adults in the UK for depression is lower than for anxiety, and anxiety and depression combined is most prevalent (Mental Health Foundation, 2019b). However, it was unsurprising that the groups with a mental health problem were sub-clinical and did not show any further symptoms on the SCID-5-CV given that there is an increasing number of adults with undiagnosed mental health problems in the UK (Open Access Government, 2019) and also given that the university student population, which made up most of the sample, commonly experience mental health problems (Education Policy Institute, 2018). Consequently, it is important that this thesis has focused on these groups.

In terms of their scores on the GSS-2, FM subtest, and MFS subtest, no significant differences were found between the groups. This is inconsistent with the original expectation that the groups with sub-clinical anxiety and depression and sub-clinical anxiety would obtain higher scores on the GSS-2 and lower scores on the FM and MFS subtests than the typical group. As suggestibility can have a significant impact on vulnerable witnesses (e.g., Gudjonsson & Henry, 2003; Kebbell et al., 2004; Ridley et al., 2002), it was surprising that the participants with a mental health problem in the current research were not significantly more suggestible than the typical participants. It was also unforeseen that those with a mental health problem were no worse than their typical counterparts at facial recognition and remembering details about a story. As memory recall and identification performance has been shown to be weaker in vulnerable groups (e.g., Erickson et al., 2016; Henry & Wilcock, 2013; Maras & Bowler, 2014; Ternes & Yuille, 2008), significant group differences were expected to emerge from the results of these measures. The memory recall performance and identification accuracy of these groups will be explored further in a more ecologically valid test in Chapter 4.

Chapter 4

Study 2: Accuracy of Evidence Provided by Eyewitnesses with Sub-Clinical Anxiety and Depression, and Sub-Clinical Anxiety

Abstract

The aim of this study was to examine the relationship between mental health and eyewitness performance in adults. The State-Trait Anxiety Inventory (STAI) and Beck Depression Inventory-2 (BDI-2) were administered to 57 adults to classify for anxiety and depression. Three groups emerged: 20 adults with sub-clinical anxiety and depression, 18 adults with sub-clinical anxiety, and 19 adults with no mental health problems. All participants viewed a video clip of a crime event and took part in an initial statement taking interview, a full investigative interview, and two video identification lineups (one perpetrator present, one perpetrator absent). No significant differences in memory recall or identification accuracy emerged between groups. The implications of these findings are discussed in relation to the criminal justice process.

4.1. Introduction

This chapter examines the accuracy of evidence provided by mock witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety. The mock witnesses were classified as having these mental health problems from a range of psychometric measures outlined in Chapter 3. As discussed in Chapter 1, it has long been accepted that witnesses are a central feature of an investigation (e.g., Heaton-Armstrong et al., 2006; Kebbell & Milne, 1998; Milne & Bull, 1999) and the accuracy of their evidence is crucial (e.g., College of Policing, 2013b; Cutler et al., 1990). However, it has been shown that vulnerability has the capacity to impair eyewitness memory performance (e.g., Henry & Gudjonsson, 2004; Lewy et al., 2015; Maras & Bowler, 2014; McCrory et al., 2007; Ternes & Yuille, 2008; West & Stone, 2014) as well as eyewitness identification performance (e.g., Erickson et al., 2016; Havard & Memon, 2009; Wilcock & Henry, 2013).

Mental health is considered a vulnerability by the justice system (Ministry of Justice, 2011) and a large body of research has demonstrated that anxiety (e.g., Buodo et al., 2011; Burriss et al., 2008; Pacheco-Unguetti et al., 2011; Plana et al., 2014) and depression (e.g.,

Airaksinen et al., 2007; Austin et al., 2001; Gallassi et al., 2001; McDermott & Ebmeier, 2009) are associated with general memory problems. Yet, very little research has examined the effects of these mental health problems on eyewitness memory specifically and the research that has is ambiguous. As highlighted in Chapter 1, there is research to suggest that those with high trait anxiety recall fewer correct details about an event than those with low trait anxiety (Dobson & Markham, 1992). However, it has also been argued that anxiety can aid the recall of explicit memory which is most relevant for eyewitness memory (Mitte, 2008). There is no literature on the effects of depression on eyewitness memory. Given the findings on general memory, one may suspect that memory recall performance is worse for witnesses with anxiety, or anxiety and depression combined, than for typical witnesses with neither anxiety nor depression.

Whilst the accuracy of eyewitness memory is key for a successful investigation, accurate eyewitness identification is also essential (Wells & Loftus, 2013). To date, there has been minimal effort to explore the effects of mental health on eyewitness identification performance. Research findings have suggested that trait anxiety has no effect on identification performance (e.g., Valentine & Mesout, 2008), yet improvements in depressive symptoms appear to be related to better identification accuracy (e.g., Rounding et al., 2014). As a large body of literature suggests that identification performance can be impaired by a witness's vulnerability (e.g., Kassin et al., 2001; Memon et al., 2003; Wilcock & Henry, 2013), one may suggest that the identification performance of witnesses with anxiety, or anxiety and depression combined, may be worse than the identification performance of witnesses with no mental health problems. In order to enhance our understanding of their identification capabilities, it is vitally important that further research is conducted. Given that the findings of the questionnaire study in Chapter 2 revealed that legal professionals frequently come into contact with witnesses with anxiety and depression, particularly anxiety, and these mental health problems are two of the most prevalent within the community (Mental Health Foundation, 2019b), an exploration into their eyewitness capabilities is very much needed. The professionals who completed the questionnaire stated that they did not know if the evidence provided by anxious and depressed witnesses was accurate which provides further support for the need for research on this matter. It has become clear that professionals' perceptions of witnesses with anxiety and depression are based predominantly on their own personal experiences and, whilst their perceptions may be correct, there is still a need for robust evidence on the capabilities of such witnesses to reduce any potential biases. This will ensure that

professionals have an accurate and valid knowledge base on which to base their decisions which will inevitably enhance the provision of best evidence.

The aim of the present study was to investigate the eyewitness performance of adults with sub-clinical anxiety and depression, adults with sub-clinical anxiety, and typical adults with no mental health problems when exposed to a mock staged crime. This was achieved through the use of an initial statement taking interview, a full investigative interview, and two video identification lineups. The decision to include an initial statement taking interview was based on the fact that little research has looked at statement taking and witness performance. In terms of the full investigative interview, research suggests that the Cognitive Interview (CI) (Fisher & Geiselman, 1992) is one of the most effective methods at enhancing recall performance (Memon, Meissner, & Fraser, 2010) and the current interview procedure used in the UK is based on the CI (Ministry of Justice, 2011). It has been shown that the modified version of the CI is just as effective as the full CI but less demanding for the interviewer (Dando, Wilcock, & Milne, 2009) and consequently, whilst the full CI was not adopted for this study; some of its core elements were used, namely; develop rapport, report everything, and mental reinstatement of context (MRC). With regard to developing rapport, research suggests that interviewers should invest time at the beginning of the interview to develop a meaningful affinity with the witness (Collins, Lincoln, & Frank, 2002). In terms of reporting everything, it appears that encouraging the witness to do this, even reporting unimportant and partial details, is an effective way of improving recall performance (Pescod, Wilcock, & Milne, 2013). Regarding MRC, this cognitive component of interviewing is incorporated into current police training methods used with less serious crime (Ministry of Justice, 2011), providing justification for its use in the present study. Furthermore, a video lineup procedure is the current identification procedure used in the UK (Ministry of Justice, 2011) and therefore this procedure was used in this thesis. A number of eyewitness studies have found that the identification performance of vulnerable witnesses is affected in both PP and PA lineups (e.g., Memon et al., 2003; Rose et al., 2003; Wilcock & Henry, 2013), providing justification for the use of both lineup types. In addition, eyewitness identification confidence is regarded as an important indicator of accuracy (Brewer & Wells, 2006) and therefore confidence ratings were obtained in the present research. There is also research to suggest that unbiased lineup instructions are crucial for eliciting accurate identifications (Hope & Sauer, 2014) and, in current police practice, it is recommended that the witness is informed that the

perpetrator ‘may or may not be in the lineup’ (Home Office, 2017). Consequently, unbiased lineup instructions were administered prior to the video identification lineups in this thesis.

4.1.1. The Present Study

Due to a lack of previous research examining the eyewitness capabilities of witnesses with a mental health problem, it is difficult to form hypotheses. However, based on previous literature that has examined eyewitness memory in other vulnerable groups as well as research on mental health and general memory, it is expected that memory recall performance at interview of mock witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, would be worse than that of typical witnesses. It is also hypothesised that their lineup identification performance would be worse.

4.2. Method

4.2.1. Design

A mock witness paradigm was used to investigate witness performance during 1) a statement taking interview, 2) a full investigative interview, and 3) PP and PA video identification lineups. The study was a one-way between participants design with one independent variable which was mental health (sub-clinical anxiety and depression, sub-clinical anxiety, and typical with no mental health problems). The dependent variables were memory recall performance (at initial statement taking interview and at full investigative interview) and identification performance (on video identification lineups).

4.2.2. Participants

A total of 57 participants (mean age = 23.42, *SD* = 7.29) comprising 48 females and 9 males took part in the study on a voluntary basis or in return for research participation points. For a MANOVA examining the effect of the independent variable (mental health condition) on recall at interview (correct recall, incorrect recall, confabulations, and accuracy), a post hoc power analysis on the sample of 57 was conducted using the software package, GPower (Faul, Erdfelder, Lang, & Buchner, 2007). The recommended effect sizes used were as follows: small (.10), medium (.30), and large (.50; see Cohen, 1988). The alpha level used for this analysis was $p < .05$. A post hoc analysis revealed that the statistical

power for this study was .80. Thus, there was adequate power at the large effect size. As revealed in Chapter 3, there were three groups: typical (mean age = 22.53, *SD* = 6.27), sub-clinical anxiety and depression (mean age = 23.70, *SD* = 8.37), and sub-clinical anxiety (mean age = 24.06, *SD* = 7.32). Table 4.1 presents the total number, mean age, SD, and age range for males and females in each group. There was no effect of group (typical, sub-clinical anxiety and depression, sub-clinical anxiety) on age, $F(2, 54) = .22$, $p = .80$. Within the sub-clinical anxiety and depression group, the mock witnesses had mild (N = 12), moderate (N = 3), and severe (N = 5) depression. All groups were recruited from the local community and the University of Winchester via e-mail, telephone, research participation scheme, or participant recruitment posters.

Table 4.1: Total number, mean age, SD, and age range for males and females in each group

	Males				Females			
Group	*N*	*Mean*	*SD*	*Range*	*N*	*Mean*	*SD*	*Range*
Typical	2	24.50	7.78	19-30	17	22.29	6.31	18-43
Anxiety and Depression	3	27	7.81	22-36	17	23.12	8.55	18-48
Anxiety	4	26	6.16	19-34	14	23.50	7.73	18-44

4.2.3. Materials

Stimulus event. The video clip depicted a three-minute non-violent distraction burglary held within the Psychology building at the University of Winchester filmed specifically for this research. The burglary took place in a classroom and the video clip showed two male perpetrators who were distinctively different in visual appearance (see Appendix M) and a female victim. The two perpetrators were shot from close up as well as at a distance. The total length of time that each perpetrator was in view for was two minutes and 30 seconds and each perpetrator was seen in close up shots of his face for 24 seconds. Participants were not familiar with any of the actors shown in the video clip.

Measures of depression and anxiety. Participants were measured separately for anxiety and depression using two measures: State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983) and Beck Depression Inventory-2 (BDI-2; Beck et al., 1996) (see Appendices B and C). The Structured Clinical Interview for DSM-5 Disorders – Clinical Version (SCID-5-CV; First et al., 2016) (see Appendix D) was also used to support and provide further insight into the baseline measures of anxiety and depression, if necessary. All three measures were administered immediately after the initial statement taking interview (refer to Chapter 3 for a detailed description of these measures).

Measures of memory. Participants completed two sub-tests of the Test of Memory and Learning-2 (TOMAL-2; Reynolds & Voress, 2007). These included a verbal subtest (Memory for Stories (MFS)) and a nonverbal subtest (Facial Memory (FM)) (see Appendix E). The MFS subtest provided a measure of meaningful recall which was appropriate for this study as participants were required to recall details of the event, like a story. The FM subtest provided a measure of recognition and identification of faces which was also a suitable test to use as participants were asked to subsequently identify the faces of the perpetrators shown in the event on video identification lineups (refer to Chapter 3 for a detailed description of these measures).

Gudjonsson Suggestibility Scale-2 (GSS-2). Suggestibility was measured using the Gudjonsson Suggestibility Scale-2 (GSS-2; Gudjonsson, 1997) (see Appendix F). This scale assessed the extent to which participants gave in to interrogative pressure by agreeing with inaccurate details of an event suggested by leading questions (to yield to the suggested evidence being put to them) and altering their evidence in response to external pressure (a tendency to shift response) (Gudjonsson, 1997). Prior to the full investigative interview, participants listened to a story that was read aloud by the researcher and were asked to provide a free recall account. After the investigative interview, this process was repeated but this time, participants were presented with a set of 20 questions at the end (15 of which were leading). After receiving 'negative feedback' by being told that they had made a number of errors and it was therefore necessary to go through the questions once more, the same set of questions were repeated and participants were asked to be more accurate in their responses (Gudjonsson, 1997) (refer to Chapter 3 for a detailed description of this measure).

Interview Protocol. Participants took part in an initial statement taking interview during which their initial evidence was recorded akin to a statement being taken at the scene of a crime. This interview was conducted as soon as possible after watching the video clip to ensure that 1) the event was still vivid in their memory and 2) the evidence was gathered before participants had an opportunity to discuss the event with others. The initial stage of this interview allowed for free recall as participants were presented with the following statement: *"Tell me what you remember about what you have just seen. Please provide as much information about the event as possible".* The researcher remained quiet to allow participants to recall the event at their own pace. A number of follow up questions were then asked based upon what was said during free recall, such as *"what did they do?"* and *"what did they look like?"* Although not blind to the video's content, the interviewer adopted an unbiased questioning style. The interview was audio and video recorded.

Participants took part in a full investigative interview five to nine days later which was conducted in a different location to the initial statement taking interview. It replicated a standard interview based on current police practice (College of Policing, 2013a) and in accordance with the ABE guidance which suggests the use of a phased interview structure for all witnesses (Ministry of Justice, 2011). This structure comprised four main phases: 1) establishing rapport, 2) initiating and supporting a free narrative account, 3) questioning, and 4) closure. Initially, the researcher asked participants some questions about themselves and offered information about herself as a way of building rapport and ensuring that participants felt relaxed before the interview commenced. They were then asked to recall as much detail as they could about the event depicted in the video clip shown previously. They were asked to include all details even if particular details seemed unimportant and informed that it was important not to guess or make anything up. In accordance with current police practice, MRC was brought in during the free recall part of the interview. Participants were asked to mentally reinstate the context in which the event took place. With a pause between each phase, they were asked to 1) think back to the day that they saw the video clip, 2) think about what they were doing on that morning, 3) think about the weather on that day, 4) think about what they were doing immediately before viewing the video, 5) think about the room in which they viewed the video, 6) think about the layout of the room and how it looked and smelt, 7) think about anyone else who was in the room at the time, 8) think about the computer screen, 9) think about how they felt when the video started, and 10) think about what they saw and heard. They were then asked to report everything that they could remember about the event. This was followed

by a questioning phase ten seconds later during which participants were asked one question about each main topic mentioned during free recall. To be compatible with the witness's memory trace, the order of the questions was guided by their free recall. In accordance with the ABE guidance, questioning commenced with open-ended questions and proceeded to specific-closed questions, if necessary (Ministry of Justice, 2011). Whilst open-ended questions allow a witness to further freely recall the event details and have control over the information that they reveal, specific-closed questions ask for a narrower description of specific aspects of an event (Waterhouse, Ridley, Wilcock, & Bull, 2015). If used, specific-closed questions were kept fairly short and simple as the participants with a mental health problem may have had limited working memory and consequently may have been unable to remember complex questions in order to respond accurately. When answering the questions, participants were asked not to guess if they were unable to answer a question and it was made clear that it was entirely acceptable to say that they did not know the answer. The interview was audio and video recorded (see Appendix K for interview protocol).

Scoring. Each item of information recalled during the initial statement taking interview was classified as either *correct, incorrect* (e.g., saying that the male's hair was blonde instead of brown), or as a *confabulation* (mentioning a detail or event that was not present or did not happen). For example, the video clip showed a male wearing a white t-shirt and blue jeans carrying a blue rucksack. When asked to recall what this male was wearing, a participant may say 'the male was wearing a white (1 correct) t-shirt (1 correct) and black (1 incorrect) shorts (1 incorrect), and he was carrying a black (1 incorrect) rucksack (1 correct). Regarding the full investigative interview, each item of information recalled was classified as either *correct repeated* (a correct item of information initially recalled in the statement taking interview and the same item repeated again in the full investigative interview), *correct new* (a new correct item of information), *incorrect repeated* (an incorrect item of information initially recalled in the statement taking interview and the same item repeated again in the full investigative interview), *incorrect new* (a new incorrect item of information), as a *repeated confabulation* (a confabulated detail initially recalled in the statement taking interview and the same detail repeated again in the full investigative interview), or as a *new confabulation* (a new confabulated detail). All subjective statements or opinions were disregarded (Dando et al., 2009).

Inter-Rater reliability. A second rater coded 20% of the participants' interviews (i.e., twelve initial statement taking interviews and twelve full investigative interviews). This sub-sample was randomly selected. Inter-rater reliability was calculated for correct, incorrect, and confabulated details with regard to the initial statement taking interviews and correct repeated, correct new, incorrect repeated, incorrect new, confabulated repeated, and confabulated new details with regard to the full investigative interviews. A description of these details will be provided in the results section. The two raters' scores were significantly correlated for correct, incorrect, and confabulated details: $r = .95$, $p < .001$; $r = .90$, $p < .001$; and $r = .80$, $p < .05$. The raters' scores were also significantly correlated for correct repeated, correct new, incorrect repeated, incorrect new, confabulated repeated, and confabulated new details: $r = .90$, $p < .001$; $r = .85$, $p < .001$; $r = .91$, $p < .001$; $r = .71$, $p < .05$; $r = .82$, $p < .05$; and $r = .76$, $p < .05$. Any conflicts in scoring were resolved by discussion between the raters.

Video identification lineups. Four video identification lineups were constructed (one PP lineup and one PA lineup for each perpetrator) (see Appendix M) by police staff at Hornsey Identification Suite located at Hornsey Police Station in London. The lineups were constructed in accordance with PACE (1984) Code D (Home Office, 2017) and the lineup production software used to compile the lineups was Profile Matching (PROMAT). All participants were shown one PP lineup and one PA lineup; the order of which was counterbalanced. Each lineup comprised nine individuals. The PP lineup included one of the actual perpetrators and eight lineup members. The PA lineup included a perpetrator replacement (innocent suspect) and eight different lineup members. A set of instructions were administered in accordance with PACE (1984) Code D (Home Office, 2017) (see procedure section of this chapter). In line with current police practice, each lineup was shown twice (Home Office, 2017). In the first instance, participants watched the sequence of moving images without providing a response. In the second instance, participants watched the sequence of moving images again and following this they were given the opportunity to provide a response.

Lineup Fairness. The video clip of the crime event was piloted and the fairness of the lineups was analysed prior to being used in the current research. Ten participants comprising three males (mean age = 26.67, $SD = 3.10$) and seven females (mean age = 24.43, $SD = 4.35$) were shown the video clip and asked to describe each perpetrator from the lineup image of the perpetrator using criteria based on the descriptive categories

currently used by the police when using the PROMAT database to create lineups. These categories included: gender, age, ethnicity, hair colour, and build. The descriptions provided by the participants were collated and one single description was created for each perpetrator (a modal description). This modal description was then given to 17 new participants who were postgraduate students at the University of Winchester comprising two males (mean age = 21.50, *SD* = .71) and 15 females (mean age = 22.07, *SD* = 1.62). They were shown the simultaneous matrix of the PROMAT PP lineup for each perpetrator and asked to identify the perpetrators based on the descriptions (without having seen the event). In terms of assessing lineup fairness, functional size (FS) was used as it is recognised as an important way of determining the fairness of a lineup (Wells, Leippe, & Ostrom, 1979). The FS was calculated using n/D, where n = the total number of participants and D = the number of participants correctly identifying the perpetrator (Wells et al., 1979). Out of the 17 participants asked to identify the perpetrators, three correctly identified the perpetrator in each case providing a FS of 6 in both cases. Whilst a FS of 6 is not perfect, the lineups were ecologically valid as they were created by the police using their lineup production software (PROMAT). Furthermore, the position of the perpetrator in each lineup was counterbalanced across participants (ranging from position two to position eight) to control for any possible effects of perpetrator lineup position on identification performance.

4.2.4. Procedure

On arrival, participants were greeted and provided with an information sheet to read (see Appendix H). If they were happy to take part, they were asked to provide written consent (see Appendix I). They were given the opportunity to ask questions and then instructed to watch the video clip. In order to ensure as much as possible that the encoding process was incidental, no further instructions were given. Whilst intentional retrieval is required to recall a witnessed event in as much detail as possible, the event itself is experienced and encoded incidentally in most real-life situations and consequently incidental encoding is a more ecologically valid approach for eyewitness research. However, it was difficult to ensure that the event in this study was encoded entirely incidentally due to the fact that participants were aware that they were taking part in eyewitness research. Nevertheless, measures were put in place to discourage intentional encoding, for example; participants were provided with minimal detail about the nature of the event and the types of questions that would be asked.

After watching the video clip, the initial statement taking interview was conducted in a private room to create a relaxed environment. Participants were told that they were going to be asked some questions about the video clip that they had just seen. Initially, they provided a free recall account. This was followed by a number of follow up questions based upon what was said during free recall. Immediately after the interview, participants completed the BDI-2, STAI, and SCID-5-CV in order to classify their levels of depression and anxiety. If participants asked about these tests, it was made clear to them that the tests were being used for research purposes and that the researcher was not qualified to make diagnoses. They were told that if they had any concerns, they should seek help from their GP.

Participants returned for the full investigative interview five to nine days later. They were greeted, thanked for attending, and asked some general questions to develop rapport. Initially, they completed the MFS subtest which served as a rehearsal prevention task. They were then reminded that they had signed a form giving their consent for the interview to be audio and video recorded for use in subsequent research, and it was ensured that they were still happy for this to happen. The purpose of the interview was explained and participants were asked to freely recall as much detail as they could about the event depicted in the video clip shown previously. Once the participants had finished their free recall, there was a ten-second pause before they were asked questions based on what was said during free recall. At the end of the interview, they were given the opportunity to add to or change their information and ask any questions before being thanked for their time. The entire interview was video and audio recorded. Following the interview, the GSS-2 was administered. The story was read aloud to participants by the researcher and they provided a free recall account of what happened. Their accounts were audio recorded for subsequent transcription. Following the GSS-2, participants took part in a video PP lineup and a video PA lineup (one for each perpetrator), as per PACE (1984) Code D (Home Office, 2017). Participants were told that the perpetrator seen in the event may or may not appear in the lineup. They were asked not to make any decision as to whether the individual they saw on the video clip was on the set of images until they had seen the whole set at least twice. They were informed that they could ask to see all of the images or a particular image again and there was no limit on how many times they could view the whole set of images or any part of them. Each individual shown in the set of images was identifiable by number and participants were asked to use this number if they wished to make an identification. If an individual was selected, participants were shown that particular image again to confirm

the identification. If they were unable to make a positive identification, they were instructed to say so. It was important that care was taken to ensure that participants were not directed in any way to any one individual image, as such the researcher stood behind participants out of sight. After making a lineup decision, participants were asked to indicate how confident they were in their response on a 10-point Likert scale with 1 indicating 'not at all confident' and 10 indicating 'completely confident' (see Appendix L). Participants were tested individually and not able to communicate with each other about the lineup, and were not told whether previous participants had made an identification. Following the identification lineups, the GSS-2 was administered again. However, after the free recall phase in this instance, participants were told that they were going to be asked some questions about the story and to try to be as accurate as possible. The set of 20 questions (including 15 leading questions) were presented. After receiving 'negative feedback', the same set of questions were repeated and participants were asked to be more accurate in their responses. Their accounts were audio recorded for subsequent transcription. Finally, participants completed the FM subtest and this measure was administered after the identification lineups to prevent any potential interference effects. At the end of the session, they were debriefed (see Appendix J) and thanked for their time.

4.3. Results

4.3.1. Effect of Condition on Memory Recall Performance at Interview

The effect of condition (typical, sub-clinical anxiety and depression, and sub-clinical anxiety) on a number of variables relating to memory recall at interview was explored. Tables 4.2, 4.3, 4.4, and 4.5 display the means, SD, and range for the scores obtained on each variable across groups. With regard to interview 1, the variables examined included: correct recall, incorrect recall, confabulations, and accuracy. Accuracy was calculated by dividing correct recall by the sum of correct recall, incorrect recall, and confabulations. Regarding interview 2, the variables examined included: total correct recall (new and repeated information), total incorrect recall (new and repeated information), total confabulations (new and repeated information), and accuracy. Accuracy was calculated by dividing total correct recall by the sum of total correct recall, total incorrect recall, and total confabulations. New information referred to details that participants recalled for the first time at interview 2 whereas repeated information referred to details that they recalled at interview 2 but had already recalled at interview 1. Total correct recall, total incorrect

recall, and total confabulations were then examined in more depth so new and repeated information was explored separately.

Interview 1. At interview 1, the typical group recalled the most correct details but overall accuracy was highest for the group with sub-clinical anxiety and depression. The group with sub-clinical anxiety recalled the most incorrect details but the least number of confabulations.

Interview 2. At interview 2, the typical group recalled the most correct details and overall accuracy was also highest for this group. Similar to interview 1, the group with sub-clinical anxiety recalled the most incorrect details but the least number of confabulations.

New and repeated information. In terms of new information recalled at interview 2, the group with sub-clinical anxiety recalled the most new correct information but also the most new incorrect information. The group with the highest number of new confabulations recalled was the typical group. With regard to repeated information recalled at interview 2, the typical group recalled the most repeated correct information and the group with sub-clinical anxiety recalled the most repeated incorrect information. The group with the highest number of repeated confabulations recalled was the group with sub-clinical anxiety and depression.

Table 4.2: Mean scores, SD, and range for correct, incorrect, confabulations, and accuracy across groups at interview 1

	Correct			Incorrect			Confabulations			Accuracy		
Group	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*
Typical	47.47	14.65	20-75	2.53	1.17	0-4	1.89	1.20	0-4	91.03	3.50	85-97
Anxiety and Depression	43.50	11.09	16-60	2.35	1.98	0-7	1.75	1.12	0-3	91.67	3.55	87-97
Anxiety	43.44	11.90	23-63	3.94	3.04	0-10	1.50	.86	0-3	88.55	6.36	79-96

Table 4.3: Means, SD, and range for total correct, total incorrect, total confabulations, and accuracy across groups at interview 2

	Total correct			Total incorrect			Total confabulations			Accuracy		
Group	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*
Typical	53.05	13.05	26-75	4.42	2.59	1-11	1.84	.96	0-3	89.49	4.49	80-98
Anxiety and Depression	48.35	8.73	34-67	4.35	2.96	0-13	1.85	1.14	0-4	88.81	5.54	71-95
Anxiety	51.06	11.14	33-70	5.72	3.12	1-12	1.17	.99	0-3	88.17	4.43	79-95

Table 4.4: Means, SD, and range for new correct information, new incorrect information, and new confabulations across groups at interview 2

	Correct (new)			Incorrect (new)			Confabulations (new)		
Group	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*
Typical	14.58	7.31	6-31	2.63	2.27	0-9	.95	.71	0-2
Anxiety and Depression	14.60	6.54	7-33	3.00	2.66	0-12	.80	.89	0-3
Anxiety	17.06	4.65	12-25	3.17	2.38	0-9	.22	.55	0-2

Table 4.5: Means, SD, and range for repeated correct information, repeated incorrect information, and repeated confabulations across groups at interview 2

	Correct (repeated)			Incorrect (repeated)			Confabulations (repeated)		
Group	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*	*Mean*	*SD*	*Range*
Typical	38.47	12.45	17-62	1.79	1.32	0-4	.89	.94	0-2
Anxiety and Depression	33.75	9.86	12-52	1.35	1.31	0-5	1.05	.89	0-3
Anxiety	34.00	10.92	18-55	2.56	2.55	0-8	.94	.94	0-3

In order to further explore the effect of condition on memory recall at interview, a series of MANOVAs were conducted. The statistical outputs for the analyses are presented in Appendix P. The first MANOVA was conducted to examine the effect of condition on correct recall, incorrect recall, confabulations, and accuracy at interview 1. Although the assumption of homogeneity was not met for the effect of condition on incorrect recall and accuracy (see Appendix P), there was no need to transform the data as the sample sizes were not vastly different (Blanca et al., 2017; Field, 2018). In terms of interpreting the MANOVA results, Pillai's trace statistic was used because it is the most powerful and robust (Field, 2018). Using Pillai's trace, there was no significant effect of condition on correct recall, incorrect recall, confabulations, and accuracy at interview 1, $V = 0.25$, $F(8, 104) = 1.88$, $p = .07$.

The second MANOVA was conducted to examine the effect of condition on total correct recall (new and repeated information), total incorrect recall (new and repeated information), total confabulations (new and repeated information), and accuracy at interview 2. Using Pillai's trace, there was no significant effect of condition on total correct recall, total incorrect recall, total confabulations, and accuracy at interview 2, $V = 0.17$, $F(8, 104) = 1.18$, $p = .32$.

A third MANOVA was conducted to examine the effect of condition on repeated correct recall, new correct recall, repeated incorrect recall, new incorrect recall, repeated confabulations, and new confabulations at interview 2. Although the assumption of homogeneity was not met for the effect of condition on repeated incorrect recall (see Appendix P), there was no need to transform the data as the sample sizes were not vastly different (Blanca et al., 2017; Field, 2018). Using Pillai's trace, there was no significant effect of condition on repeated correct recall, new correct recall, repeated incorrect recall, new incorrect recall, repeated confabulations, and new confabulations at interview 2, $V = 0.31$, $F(12, 100) = 1.50$, $p = .14$.

4.3.2. Baseline Measures and Correct Memory Recall at Interview

A series of bivariate correlational analyses were conducted to explore whether any relationships existed between participants' scores on the baseline measures (described in Chapter 3) and their correct recall at interview. Correct recall referred to the total number of items correctly recalled. As there were two interviews, correlational analyses were

conducted separately for each interview. For the purpose of the results section, the interviews are referred to as interview 1 (initial statement taking interview) and interview 2 (full investigative interview). The statistical outputs for the analyses are presented in Appendix N.

Interview 1. There was no significant relationship between BDI-2 scores of depression and correct recall at interview 1 (r = -.01, p = .97). Similarly, there was no significant relationship between STAI scores of trait anxiety and correct recall (r = -.21, p = .11) or STAI scores of state anxiety and correct recall (r = -.25, p = .07). Scores on the MFS subtest of the TOMAL-2 were not significantly related to correct recall (r = .19, p = .17); however, there was a significant positive relationship between the FM subtest scores and correct recall (r = .29, p < .05), suggesting that better facial identification performance was associated with more items correctly recalled. There was also a significant negative relationship between total suggestibility scores on the GSS-2 and correct recall (r = -.26, p < .05), suggesting that greater resistance to leading questions was associated with more items correctly recalled.

Interview 2. For all baseline measures, the individual measures were not significantly related to correct recall at interview 2. There was no significant relationship between BDI-2 scores of depression and correct recall (r = -.10, p = .48). There was also no significant association between STAI scores of trait anxiety and correct recall (r = -.26, p = .06) or STAI scores of state anxiety and correct recall (r = -.15, p = .28). Regarding the TOMAL-2 subtests, scores on the MFS subtest did not significantly correlate with correct recall (r = .19, p = .16) and this was also true for the FM subtest (r = .25, p = .07). Finally, there was no significant relationship between total suggestibility scores on the GSS-2 and correct recall (r = -.20, p = .14).

4.3.3. Baseline Measures and Perpetrator Identification Accuracy

A series of bivariate correlational analyses were also conducted to explore whether any relationships existed between participants' scores on the baseline measures and their accuracy at identifying the perpetrators on the identification lineups. As participants viewed two lineups relating to two different perpetrators, correlational analyses were conducted separately for each perpetrator. The statistical outputs for the analyses are presented in Appendix O. For all baseline measures, the individual measure was not significantly related to participants' accuracy at identifying either perpetrator.

Perpetrator 1 accuracy. There was no significant relationship between BDI-2 scores of depression and perpetrator 1 accuracy (r = .06, p = .68). There was also no significant relationship between STAI scores of trait anxiety and perpetrator accuracy (r = .01, p = .95) or STAI scores of state anxiety and perpetrator accuracy (r = .06, p = .64). The analyses revealed that the TOMAL-2 scores did not significantly correlate with perpetrator accuracy for the MFS subtest (r = -.06, p = .65) or the FM subtest (r = -.06, p = .68). In terms of suggestibility, there was no significant relationship between total suggestibility scores on the GSS-2 and perpetrator accuracy (r = -.06, p = .68).

Perpetrator 2 accuracy. There was no significant relationship between BDI-2 scores of depression and perpetrator 2 accuracy (r = -.03, p = .81). There was also no significant relationship between STAI scores of trait anxiety and perpetrator accuracy (r = -.02, p = .91) or STAI scores of state anxiety and perpetrator accuracy (r = .07, p = .59). The MFS subtest scores did not significantly correlate with perpetrator accuracy (r = .10, p = .48) and neither did the FM subtest scores (r = -.13, p = .34). Regarding suggestibility, there was no significant relationship between total suggestibility scores on the GSS-2 and perpetrator accuracy (r = .04, p = .79).

4.3.4. Effect of Condition on Perpetrator Identification Accuracy and Confidence

The effect of condition (typical, sub-clinical anxiety and depression, and sub-clinical anxiety) on identification accuracy was explored. Initially, a loglinear analysis was conducted to explore the association between three variables: condition, perpetrator present/perpetrator absent (PP/PA), and accuracy for each perpetrator separately. For the analysis to be reliable, the frequencies need to be large enough to detect a genuine effect (e.g., no less than 5 and greater than 1) (Field, 2018). However, the frequencies in this study were too small to detect a genuine effect when examining at the PP/PA level (see Tables 4.6 and 4.7 and Appendix Q).

Table 4.6: Accuracy frequency across groups for PP/PA lineups for perpetrator 1

Condition	PP			PA	
	Hit	False ID	Incorrect rejection	Correct rejection	False ID
Typical	5	4	1	5	4
Anxiety and Depression	4	3	3	5	5
Anxiety	6	3	1	7	1

Table 4.7: Accuracy frequency across groups for PP/PA lineups for perpetrator 2

Condition	PP			PA	
	Hit	False ID	Incorrect rejection	Correct rejection	False ID
Typical	2	2	5	7	3
Anxiety and Depression	7	1	3	5	4
Anxiety	5	1	2	6	4

As a result, the data by perpetrator presence was collapsed (see Tables 4.8 and 4.9) and a Chi-square test was conducted for each perpetrator separately examining just condition and accuracy (see Appendix R). A Chi-square test conducted for perpetrator 1 found no significant association between condition and participants' lineup accuracy, χ^2 (2) = 2.99, p = .22. A Chi-square test conducted for perpetrator 2 found no significant association between condition and participants' lineup accuracy, χ^2 (2) = 0.90, p = .64.

Table 4.8: Accuracy frequency across groups for perpetrator 1

Condition	Accurate	Inaccurate
Typical	10	9
Anxiety and Depression	9	11
Anxiety	13	5

Table 4.9: Accuracy frequency across groups for perpetrator 2

Condition	Accurate	Inaccurate
Typical	9	10
Anxiety and Depression	12	8
Anxiety	11	7

Bivariate correlational analyses were conducted to explore whether a relationship existed between participants' confidence and their accuracy at identifying perpetrator 1 and perpetrator 2. The statistical outputs for the analyses are presented in Appendix S. An accurate identification was coded as 1 and an inaccurate identification was coded as 2. There was a significant relationship between confidence and accuracy for perpetrator 1 (r = -.43, p = < .05), suggesting that the more confident participants were in their decision, the more accurate they were at identifying the perpetrator. There was also a significant relationship between confidence and accuracy for perpetrator 2 (r = -.26, p = < .05), suggesting that the more confident participants were in their decision, the more accurate they were at identifying the perpetrator.

In order to explore whether there was an effect of condition (typical, sub-clinical anxiety and depression, and sub-clinical anxiety) on confidence, a one-way ANOVA was conducted

separately for each perpetrator. The assumption of homogeneity was met in both cases. The statistical outputs for the analyses are presented in Appendix T. There was no significant effect of condition on confidence for perpetrator 1, $F(2, 54) = .78$, $p = .46$. There was also no significant effect of condition on confidence for perpetrator 2, $F(2, 54) = 1.57$, $p = .22$.

4.4. Discussion

The aim of this study was to compare the eyewitness capabilities, in terms of both memory recall and identification accuracy, of adults with sub-clinical anxiety and depression, adults with sub-clinical anxiety, and typical adults with no mental health problems when exposed to a mock staged crime. With regard to memory recall at interview, it was originally hypothesised that higher BDI-2 and STAI scores would be significantly associated with lower recall of correct information. Yet, there was no significant relationship revealed between the measure of anxiety and correct recall, or the measure of depression and correct recall at either interview. Furthermore, there was no significant association revealed between the MFS subtest and correct recall at either interview. These findings are surprising. There is evidence within the literature to suggest that eyewitness memory is worse for vulnerable witnesses than for typical witnesses (e.g., Henry & Gudjonsson, 2004; Lewy et al., 2015; Maras & Bowler, 2014; West & Stone, 2014) and therefore it was expected that higher BDI-2 and STAI scores would significantly correlate with lower memory recall of correct information. The findings of this study suggest that correct recall is unaffected by sub-clinical anxiety and depression. The fact that no significant correlation was revealed between the MFS subtest scores and correct recall at interview was also an unexpected finding as this subtest measured participants' recall of a story which is similar to recalling details about an event. Consequently, it was anticipated that a higher number of items recalled correctly on this test would significantly correlate with better recall performance at interview. With regard to the FM subtest, there was a significant positive correlation between the FM scores and correct recall at interview 1. Whilst it could be argued that facial memory is more relevant to identification performance, one may suggest that facial memory is also important for recalling details about the event itself if the event involves people which may explain this finding. However, this was not replicated at interview 2. In terms of the GSS-2, there was a significant negative correlation between total suggestibility and correct recall at interview 1 and one may suggest that this is to be expected given that research has demonstrated that

suggestibility can impair correct memory recall (e.g., Jaschinski & Wentura, 2002; Zaragoza et al., 2007). Yet, this relationship was not replicated at interview 2.

With regard to identification performance, it was originally expected that higher scores on the BDI-2 and STAI would be significantly associated with lower perpetrator identification accuracy. As discussed earlier in this chapter, there is evidence within the literature to suggest that the identification accuracy of vulnerable witnesses is generally poorer than that of typical witnesses (e.g., Erickson et al., 2016; Havard & Memon, 2009; Wilcock & Henry, 2013) and consequently it was anticipated that higher anxiety and depression scores would significantly correlate with lower identification accuracy. The fact that no significant relationship was revealed between these two measures and identification accuracy suggests that identification performance is unaffected by sub-clinical anxiety and depression. It was also predicted that higher scores on the FM subtest would significantly correlate with better identification accuracy; however, this relationship was not revealed. This is an unexpected finding as the FM subtest measured participants' identification of faces and therefore it was anticipated that a higher number of faces identified on this test would significantly relate to better identification performance.

As outlined in Chapter 1, this thesis originally set out to test typical witnesses with no mental health problems against witnesses with combined anxiety and depression, witnesses with anxiety only, and witnesses with depression only. However, as Chapter 3 revealed, a depression only group did not emerge when participants were measured for levels of anxiety and depression using the psychometric measures (STAI; Spielberger et al., 1983; BDI-2; Beck et al., 1996). As a result, the effects of depression on its own were not explored. The fact that a depression only group did not emerge is perhaps unsurprising given that the legal professionals who completed the questionnaire study in Chapter 2 reported interacting with witnesses with depression less frequently than witnesses with anxiety, and also reported depression to be a less common mental health problem amongst witnesses. This is supported by recent research revealing that the prevalence rate for anxiety in adults over the age of 16 is higher than for depression (Stansfeld et al., 2016). It is also to be expected that the anxiety and depression group was the largest with a total of 20 participants as combined anxiety and depression is the most common mental health problem in the UK (Mental Health Foundation, 2019b).

The eyewitness memory findings of this study are interesting. It was originally hypothesised that memory recall performance at interview would be worse for adults with sub-clinical anxiety and depression, and sub-clinical anxiety, than for typical witnesses based on previous research findings regarding the impact of mental health on general memory performance (e.g., Austin et al., 2001; Gallassi et al., 2001; Pacheco-Unguetti et al., 2011; Plana et al., 2014). Yet, in this initial investigation, no significant differences were found between the groups in memory recall performance at either interview. It seems that witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, are no worse than their typical counterparts at recalling correct or incorrect items of information, or confabulations. It also appears that their overall accuracy is equivalent. In addition, there was no significant differences revealed between the groups in their recall of new and repeated correct information, new and repeated incorrect information, and new and repeated confabulations. This indicates that adults with sub-clinical anxiety and depression, and sub-clinical anxiety, are 1) just as capable as typical adults at remembering details about an event at a later stage and 2) just as capable at retaining details about the event in their memory.

Based on previous literature, it would seem that if general memory capabilities are impaired by mental health, eyewitness memory performance would be as well. One may argue that the reason for a non-significant difference between groups at interview 1 could be due to participants providing immediate recall and consequently there was no effect of delay, preventing the risk of memory contamination. Indeed, previous research has demonstrated that early recall enhances recollection and protects the memory against the negative effects of interference (Gabbert et al., 2012). Yet, there is some evidence to suggest that individuals with high trait anxiety are less accurate on an eyewitness task than those with low trait anxiety at the encoding and retrieval stages of the memory process (Dobson & Markham, 1992), implying that these memory stages are affected to a greater degree in individuals with high trait anxiety. However, the literature on the effects of mental health on the different stages of the memory process is extremely limited and further research is needed before conclusions can be drawn about the encoding, storage, and retrieval capabilities of witnesses with a mental health problem. Furthermore, given that the general memory performance of adults with a mental health problem is worse than that of typical adults and there is research to suggest that interference between the encoding and retrieval stages can impact memory (Henderson, 2005), one may have expected the groups with sub-clinical anxiety and depression and sub-clinical anxiety in this

study to have demonstrated significantly worse memory recall performance at interview 2 than the typical group. Yet, this finding did not emerge, suggesting that they are just as capable as their typical counterparts at recalling details of an event after a delay.

The current findings regarding identification performance were also interesting. It was originally hypothesised that identification accuracy would be worse for adults with sub-clinical anxiety and depression, and sub-clinical anxiety, than for typical witnesses based on the findings of previous literature examining vulnerability and identification accuracy (e.g., Erickson et al., 2016; Henry & Wilcock, 2013; Wilcock & Bull, 2010). However, the findings of this preliminary study revealed no significant group differences in identification accuracy of either perpetrator. That is, the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, were no worse at identifying the perpetrators than the typical group. This finding is in line with previous research regarding anxiety that found no effect of trait anxiety on eyewitness identification (Valentine & Mesout, 2008). However, in the study conducted by Valentine and Mesout (2008), participants were asked to identify the person approximately 60 minutes after seeing the event and consequently the delay may have been too short for there to have been any group differences in identification accuracy. Nonetheless, the present study used a delay of five to nine days and still there was no effect of trait anxiety on identification performance. Within the literature, there have been some attempts to explore the effects of depression with research revealing that when depressive symptoms are improved, witnesses demonstrate enhanced identification accuracy (e.g., Rounding et al., 2014). However, the literature is very limited and there has been no effort until now to investigate the effect of combined anxiety and depression on identification performance. With regard to eyewitness identification confidence, the present findings revealed an association between confidence and lineup accuracy. This finding is consistent with previous research that has suggested that witnesses who give high ratings of confidence are more likely to be accurate on the lineup (Brewer, 2006; Wixted & Wells, 2017) and provides support for the suggestion that confidence may be an important indicator of eyewitness accuracy (e.g., Potter & Brewer, 1999). The present findings also revealed that there were no significant group differences in confidence ratings for either perpetrator. From this, it can be concluded that the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, were just as confident in their identification responses as the typical witnesses with no mental health problems for both perpetrators. This is inconsistent with previous research involving other vulnerable groups. For example, studies have demonstrated the confidence-accuracy relationship with

younger adults but not with older adults (e.g., Memon, Hope, Bartlett, & Bull, 2002; Wilcock, Bull, & Vrij, 2007) and, whilst confidence has been shown to predict accuracy in typical adults, it is not necessarily an indicator of accuracy in adults with ID (e.g., Wilcock & Henry, 2013).

Whilst the findings of this study were unexpected, there are factors that may explain the null effects that emerged. For example, the crime event was mild in nature and maybe not sufficiently memorable. Possibly, as a result of this, there was little variance in recall and identification scores. Had the crime been more anxiety provoking different results may have occurred. Due to where participants were recruited, there was a disproportionate number of female participants and future research should seek to address this. Whilst such factors were necessary in the research presented here, it is important to raise them in order to understand the reasons for the null effects of mental health on recall and identification performance. Such findings have implications for the CJS. The fact that adults with sub-clinical anxiety and depression, and sub-clinical anxiety, were no less capable of providing accurate and reliable witness evidence and no less accurate at identifying a perpetrator compared to typical adults is significant because it suggests that their evidence is to be regarded with the same level of credibility as any other witness. As the Crown Prosecution Service (CPS) makes clear, such witnesses have the same right to access to justice as any other witness and prosecutors should make their decisions free from assumptions or stereotypes (Crown Prosecution Service, 2009). It emerged from the findings in Chapter 2 that there is a considerable proportion of legal professionals who do not know how accurate witnesses with a mental health problem are when providing evidence and some even stated that such witnesses are not accurate at all. This demonstrates the importance of, and need for, further research on mental health and eyewitness performance.

There are some limitations of the current study. Firstly, it did not explore the eyewitness capabilities of adults with a mental health diagnosis. The findings may have been different if the performance of eyewitnesses with a formal diagnosis had been explored as an effect of mental health may have emerged. Given that there is evidence within the literature to suggest that severe cases of anxiety are associated with various cognitive deficits, such as attention and memory (e.g., Buodo et al., 2011; Plana et al., 2014) and similar findings have been revealed with major depression (e.g., McDermott & Ebmeier, 2009), this seems probable. Secondly, the participants were mainly university undergraduate students which

raises obvious questions with regard to how far the findings can be generalised from this population to the general population. A further limitation of this study is the context in which the crime event took place. The event was filmed at the University of Winchester where the majority of the participants were studying at the time. Although efforts were made to ensure that they were not familiar with the area of the university in which the event occurred, there is still a risk that they recognised the context and this may have enhanced their memory recall of the event. Furthermore, the event was filmed and shown on a video clip whereas, in real-life, an event would be witnessed live. Whilst it would have been challenging to show a live event, it would have made the research more ecologically valid. It is important to acknowledge that the findings of 'real' studies are often very different to those from controlled studies (Kebbell & Davies, 2006). However, attempts were made to make the study as real to practice as possible. For example, the rooms in which the interviews took place were set up like an interview room in current police practice and there were no windows to distract the participants. Additionally, interview protocols and lineup procedures were in accordance with current best practice in England and Wales.

To conclude, the findings of this study will contribute to the literature on the eyewitness capabilities of witnesses with a mental health problem. One may argue that the findings will also enhance legal professionals' understanding which will in turn help to improve current biases and enable them to make the correct decisions when it comes to assessing witness evidence. However, the research findings need to be replicated before we can say this with any certainty.

Chapter 5

Study 3: Cross-Examination Performance of Eyewitnesses with Sub-Clinical Anxiety and Depression, and Sub-Clinical Anxiety

Abstract

The aim of this study was to examine how adults with sub-clinical anxiety and depression, and sub-clinical anxiety, fared during a mock cross-examination compared to typical adults with no mental health problems. Forty-two adults (15 with sub-clinical anxiety and depression, 14 with sub-clinical anxiety, and 13 with no mental health problems) were cross-examined by a barrister approximately ten months after witnessing a mock crime event. No significant differences in cross-examination performance (measured by memory trace strength and cede performance) emerged between groups. The implications of these findings are discussed with regard to the criminal justice process.

5.1. Introduction

The previous chapter of this thesis revealed that witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, perform just as well as witnesses with no mental health problems at interview and on identification lineups. However, given that delayed memory recall is impaired in individuals with depression (e.g., Ramponi et al., 2010) and anxiety (e.g., Butters et al., 2011; Crespo et al., 2015), it was necessary to examine how such witnesses perform at cross-examination. At court, cross-examination is performed in an attempt to reveal the truth by means of challenging a witness's evidence (Bettenay et al., 2014) and effective cross-examination can emphasise discrepancies in witness testimony (Plotnikoff & Woolfson, 2009). Advocates will use various strategies to discredit the witness and weaken their evidence (Munkman, 1991) such as implying that the witness is mistaken (Stone, 1995), accusing them of lying (Plotnikoff & Woolfson, 2009; Spencer, 2012), and putting pressure on them to alter their response (Zajac et al., 2003). Ultimately, the aim of such techniques is to suggest that the witness should not be relied upon (Stone, 1995). As a result, testifying at court can be a stressful experience, particularly for vulnerable witnesses (Davies & Westcott, 2018). Previous research has shown that the question content and the way in which questions are framed (i.e., the use of closed leading questions) can cause significant distress for vulnerable witnesses which may result in them

providing inaccurate evidence and conveying a misleading impression as to their credibility (Keane, 2012). If such witnesses have extreme doubt about whether they will be believed or treated fairly at court, they may decide to withdraw their evidence (Davies & Westcott, 2018). Developments have been made in recent years to the ways in which vulnerability is addressed within the CJS (Davies, 2016). The ABE guidance, for example, has been produced in England and Wales to protect vulnerable witnesses during the justice process (Ministry of Justice, 2011) and practical, evidence-based guidance is available for advocates such as The Advocate's Gateway (TAG) Toolkit which provides advocates with the 'tools' to cross-examine vulnerable witnesses in the most appropriate and fair manner (The Advocate's Gateway, 2016). In recent years, under section 28 of the Youth Justice and Criminal Evidence Act 1999 (YJCEA), video-recorded cross-examination has been implemented which allows vulnerable and intimidated witnesses to video record their cross-examination before the trial (Ministry of Justice, 2016). The recorded cross-examination is played at trial so the witness does not need to be present. The main aims of section 28 are for the cross-examination to take place earlier in the process to help aid recall and improve the quality of the evidence provided by the witness (Ministry of Justice, 2016). However, this provision is not relevant for the sample in this thesis who would not be deemed sufficiently vulnerable for section 28 to be implemented.

Within the eyewitness testimony literature, the cross-examination performance of vulnerable witnesses is under-researched. This is rather concerning given that, in 2006, it was estimated that approximately 24% of witnesses who appeared at court were 'vulnerable' (Burton et al., 2006, cited in Davies & Beech, 2018, p. 401) and this figure is likely to be even higher today as indicated by the development of guidance for those preparing and supporting vulnerable witnesses during the legal process (Cooper & Norton, 2017; Ministry of Justice, 2011). Of the limited literature that has examined the cross-examination performance of vulnerable witnesses, most of the findings suggest that the accuracy of their evidence is impaired at cross-examination due to these witnesses being more inclined to alter their evidence in response to coercive questioning. For example, Kebbell et al. (2001) revealed that coercive questioning strategies can detrimentally affect the testimonies of adults with learning disabilities at cross-examination with closed leading questions being particularly influential. Similarly, Brimacombe et al. (2003) found that elderly adults are significantly less accurate than younger adults in response to cross-examination style questioning. Other research involving child witnesses in sexual abuse cases found that 75% of the children changed at least one aspect of their account at cross-

examination and many withdrew allegations of abuse entirely (Zajac et al., 2003). Yet, there is no published research to date that has assessed the cross-examination performance of witnesses with a mental health problem. There has, however, been some effort to explore the effect of misleading information on such witnesses at the interview stage of the legal process, as discussed in Chapter 1. Studies have shown that, when suggestive questions are used, anxiety can weaken the effect of misleading post-event information with high state anxiety being associated with reduced suggestibility (e.g., Ridley, 2003; Ridley & Clifford, 2004), indicating that state anxiety may protect against misinformation. On the other hand, there is also evidence to indicate that trait anxiety is associated with higher levels of suggestibility (Ridley, 2003) which is consistent with other findings that demonstrate that misleading post-event information can contaminate memory to a greater degree in vulnerable persons (e.g., Gudjonsson & Henry, 2003; Kebbell et al., 2004; Ridley et al., 2002). Such research is relevant to the study presented in this chapter which is examining the effects of suggestive questioning on memory recall performance. Nevertheless, research on the effects of suggestibility on witnesses with a mental health problem at the cross-examination stage of the legal process is non-existent and consequently their competencies at cross-examination are unknown.

As mentioned above, there has been some exploration of the cross-examination performance of vulnerable groups; however, many of the studies to date have used a 24-hour period between interview and cross-examination, and this delay is not representative of the average delay in real proceedings which is typically ten and a half months (Rossetti, 2015). The trace decay theory of memory would suggest that memory accuracy is determined by the length of time between learning and recall, and forgetting is caused by automatic decay or fading of the memory trace (Henderson, 2005). According to this theory, witnesses who are cross-examined after a substantial delay, for example ten months after an event, are likely to remember fewer details than those who are cross-examined after a much shorter delay, and witnesses with a mental health problem could be affected to a greater degree given the general memory difficulties associated with mental health (e.g., Airaksinen et al., 2007; Burriss et al., 2008; McDermott & Ebmeier, 2009; Plana et al., 2014). Research has shown that delayed memory recall is impaired in individuals with major depression (e.g., Landrø, Stiles, & Sletvold, 2001; Vythilingam et al., 2004) as well as those with sub-clinical depression (e.g., Ramponi et al., 2010), the latter being particularly relevant to the sample in the present study as the participants did not have a formal diagnosis of depression. Similar findings have been revealed in individuals with an anxiety

disorder (e.g., Butters et al., 2011; Crespo et al., 2015); however, some of the research has looked at anxiety in older populations making the findings less generalisable to the present study. Nevertheless, the effects of delay on memory in those with anxiety and depression are clear from the literature. Even though the studies used a much shorter time delay, for example two weeks, between the encoding and retrieval stages than the typical delay between interview and cross-examination, effects of delay on memory still emerged suggesting that these effects could be even more profound after a longer delay such as ten months. Whilst there is some literature that has explored the effect of cross-examination using more realistic time delays (e.g., Bettenay et al., 2014; Zajac & Hayne, 2003), the findings are mixed and the research is very much focused on child witnesses making it difficult to generalise the conclusions to adults with a mental health problem hence the need for further research.

5.1.1. The Present Study

As the cross-examination performance of witnesses with a mental health problem has not yet been assessed within the literature, it is difficult to form hypotheses but the following predictions have been proposed. Based on previous research involving other vulnerable groups as well as literature on the effects of delay on memory in individuals with anxiety and depression, the cross-examination performance of mock witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, could be worse than that of typical witnesses. However, given the findings in study 2 (see Chapter 4) which revealed no significant group differences in memory accuracy at interview, for the reduced sample in the present study there could be no significant group differences in their cross-examination performance either. The participants in the present study all took part in study 2 (see Chapter 4) during which they viewed a mock crime on video and were interviewed about the event approximately one week later in accordance with the ABE guidance (Ministry of Justice, 2011). In the present study, participants were cross-examined on their evidence provided during that interview and the cross-examinations took place after a ten-month delay (approximately).

5.2. Method

5.2.1. Design

The study was a one-way between participants design with one independent variable which was mental health (mock witnesses with no mental health problems, mock witnesses with sub-clinical anxiety and depression, and mock witnesses with sub-clinical anxiety). Participants were challenged on six topics relating to the mock crime which included: physical description (topic 1), items of clothing (topic 2), surroundings (topic 3), time of day/light conditions (topic 4), items taken (topic 5), and order of events (topic 6) (all topics mentioned by the witnesses in their earlier interviews). There were two main dependent variables. The first dependent variable was overall memory trace strength which was measured by additional information relating to a correct item of information with a possible minimum score of 0 and a possible maximum score of 18 across all six topics (maximum score of 3 per topic). The second dependent variable was overall cede performance which was measured by the total number of topics on which the participant ceded, i.e., accepted that they were wrong about their original evidence on the topic when challenged by the barrister, with a possible minimum score of 0 and a possible maximum score of 6. In addition to the main dependent variables, a further two variables were explored. The first additional variable was *topic* memory trace strength score which measured how strong the participant's memory trace was for correct items of information relating to each topic with a possible minimum score of 0 and a possible maximum score of 3. If the participant did not mention a correct item of information relating to the topic, they received a score of 0; if they did mention a correct item of information relating to the topic, they received a score of 1; if they included one additional correct detail about the item of information, they received a score of 2; and if they included two additional correct details about the item of information, they received a score of 3. Therefore, scores on each topic ranged from 0 (weak memory trace) to 3 (strong memory trace). The second additional variable was *topic* resistance score which was measured by the point at which the participant ceded to the barrister's challenge on each topic with a possible minimum score of 1 and a possible maximum score of 4. In court, cross-examinations typically flow in a manner dependent on what arises during questioning. However, in order to ensure that there was a reliable way of measuring whether the participant ceded to the challenge and at what point they did so, and to enable this to be directly comparable across participants, the barrister had a maximum of three attempts to get the participant to cede to his

challenge, i.e., accept that they were wrong about their original evidence on the topic. If the participant ceded to the challenge on first time of asking, they received a score of 1; if they ceded to the challenge on second time of asking, they received a score of 2; if they ceded to the challenge on third time of asking, they received a score of 3; and if they did not cede at all, they received a score of 4. Therefore, scores on each topic ranged from 1 to 4 and a higher score indicated greater resistance to the barrister's challenge. The actual questions that the barrister posed to the participant were entirely his choice.

5.2.2. Participants

A total of 42 participants (mean age = 23.36, *SD* = 7.72) comprising 37 females and 5 males returned to take part in the study on a voluntary basis. These participants all took part in the interview study in Chapter 4. Other cross-examination research has used samples sizes of 46 (Zajac & Hayne, 2003), 32 (Kebbell et al., 2001), and 21 (Zajac et al., 2003). Thus, the sample size for this study was at the higher end. There were three groups: typical (mean age = 21.00, *SD* = 3.92), sub-clinical anxiety and depression (mean age = 24.33, *SD* = 9.57), and sub-clinical anxiety (mean age = 24.50, *SD* = 8.20). Table 5.1 presents the total number, mean age, SD, and age range for males and females in each group. There was no effect of group (typical, sub-clinical anxiety and depression, sub-clinical anxiety) on age, $F(2, 39) = .87$, $p = .43$. Within the group with sub-clinical anxiety and depression, the mock witnesses had mild (N = 10), moderate (N = 2), and severe (N = 3) depression. In the interview study in Chapter 4, the mean scores for the group with sub-clinical anxiety and depression were 52.90 (*SD* = 6.51) for anxiety and 21.55 (*SD* = 6.74) for depression whereas in the present study, the mean scores were 51.33 (*SD* = 5.38) for anxiety and 20.87 (*SD* = 6.68) for depression thus the participants in the present study had lower scores of anxiety and depression on average. In Chapter 4, the mean score for anxiety for the group with sub-clinical anxiety was 46.50 (*SD* = 6.21) whereas in the present study, the mean score was 45.93 (*SD* = 6.67) thus the participants in the present study had a lower score of anxiety on average. With regard to the GSS-2 scores obtained in Chapter 4 by the reduced sample in this study, there was no significant effect of group on suggestibility, $F(2, 39) = .26$, $p = .78$. All participants provided their contact details after taking part in study 2 (see Chapter 4) approximately ten months earlier during which they viewed a mock crime on video and were interviewed about the event. Approximately 68% of the typical group, 75% of the group with sub-clinical anxiety and depression, and 78% of the group with sub-clinical anxiety from study 2 returned to take part in the cross-examinations in the present

study. All participants were originally recruited from the local community and the University of Winchester. They were contacted about the present study via e-mail.

Table 5.1: Total number, mean age, SD, and age range for males and females in each group

	Males				Females			
Group	*N*	*Mean age*	*SD*	*Age range*	*N*	*Mean age*	*SD*	*Age range*
Typical	1	19	-	-	12	21.17	4.04	18-31
Anxiety and Depression	1	36	-	-	14	23.50	9.35	18-48
Anxiety	3	26.33	7.51	19-34	11	24	8.65	18-44

5.2.3. Materials

Barristers. Two male barristers aged 38 years and 52 years conducted the cross-examinations over a two-month period. Both were practising barristers from two chambers in Winchester. In terms of their experience of cross-examining witnesses within a criminal capacity in court, one had eight years and the other had 13 years.

Witness statement. Prior to the cross-examinations, the barristers were provided with the interview transcript of each participant's interview from study 2 and this document was utilised in the same way as a witness statement would be in court. Each barrister was provided with only the transcripts of the participants they were individually cross-examining. Of the 42 cross-examinations that were conducted, one of the barristers conducted 26 and the other conducted 16.

Defence statement. For the cross-examination, a 'defence statement' was developed for the mock staged crime event (see Appendix U) with the support of a practising barrister in order to ensure that it was as ecologically valid as possible. The barrister had 16 years of experience and was a different barrister to those who conducted the cross-examinations. The defence statement created a more realistic situation in which the barrister was representing the defendants in relation to a charge of theft of a mobile phone, car keys,

cash in the form of notes and loose coins to the value of £32.40, sunglasses and case, and a laptop computer (see Appendix U). This document and the witness statements were utilised by the barristers to devise their cross-examination questions individually for each participant.

Cross-examination protocol. On arrival, all participants were briefed about the cross-examination and given their witness statement to read in order to refresh their memory of their evidence provided at interview, as per the ABE guidance (Ministry of Justice, 2011). They were also given the opportunity to ask any questions at this point. After entering the room, the barristers asked all participants the following set of opening questions to ensure that all participants were starting at the same point prior to the main cross-examination questioning phase: *"Did you view the video approximately ten months ago? Were there three people in the video? None of whom you'd seen before? So, their appearance was not familiar to you before you watched the video? Aside from the identification lineups, so far as you're aware; you haven't seen any of them since? So, your only sight of the individuals was a three-minute video clip, approximately ten months ago? It is presumably difficult to recall such a short clip after all this time?"* (see Appendix V). The main cross-examination questioning phase then began. The six topics on which the participants were cross-examined were selected because all participants mentioned detail relating to these topics in their original interview. The topics were covered in the following order for all participants: physical description (topic 1), items of clothing (topic 2), surroundings (topic 3), time of day/light conditions (topic 4), items taken (topic 5), and order of events (topic 6). This corresponds with the ABE guidance for cross-examining vulnerable witnesses which recommends that a systematic and logical sequence of questioning should be used to avoid any misunderstanding which could result in the witness giving evidence that is not of the best quality that they could provide (Ministry of Justice, 2011). The barristers were also instructed to avoid using a firm tone of voice which may be intimidating to a vulnerable witness (Ministry of Justice, 2011). They were not informed of the participant's mental health status prior to the cross-examination and consequently adopted a similar cross-examination technique for all participants. At the end of the main cross-examination questioning phase, the barristers read the following closing statement which was identical for all participants: *"Thank you for your time, you responded well to my questions. I asked you some difficult questions and you did well when answering these"* (see Appendix V).

Inter-Rater reliability. A second rater coded 20% of the participants' cross-examinations. This sub-sample was randomly selected. Inter-rater reliability was calculated for overall cede performance and overall memory trace strength scores. The two raters' scores were significantly correlated for both: $r = 1.00$, $p < .001$ and $r = .95$, $p < .001$.

5.2.4. Procedure

In line with the most recent research on the average court delay in England and Wales, all participants were cross-examined approximately ten months after the investigative interview (Rossetti, 2015). On arrival, participants were greeted and taken into a quiet room at the University of Winchester which was a different room to the one in which the investigative interviews took place to avoid spontaneous context reinstatement. Initially, participants were shown a copy of the participant information sheet from study 2 (see Appendix H) to remind them that they would be asked some further questions about the mock crime event in a later study (i.e., the present study). They were then informed of the purpose of taking part and that there were no risks associated with their participation. They were also told that their participation was entirely voluntary and they may withdraw from the study at any time up until 14 days after the study without penalty. They were informed that no names would be attached to the data and only the researchers involved with the study would have access to the data. It was made clear that participant details would be coded and no identifiable personal information would be stored on the computer, and that participant names would not be audio recorded. Finally, participants were informed that the questions would be audio and video recorded for subsequent transcription and potential use in a future study. If they were happy to continue, they were asked to provide written consent (see Appendix W).

After providing consent, participants were given a brief explanation of the running order of the session. They were advised that they would be meeting a barrister and an explanation of the barrister's role was given. In line with current practice, they were then given their witness statement to read to remind them of what they said at interview and told that they could take as long as they needed to read their statement. It was highlighted to all participants that the witness statement was their version of what happened on the video and an important part of the process. Once they had read their statement, it was taken from them and they were informed that the barrister would be asking them some questions about what they said at interview. They were told to tell the truth about what

they could remember and not to guess or leave anything out. It was made clear that if the barrister asked them a question to which they did not know the answer, they needed to say so. They were also instructed to tell the barrister if they did not understand a question. After these instructions were given, participants were asked if they were happy to proceed, and all were.

The barrister was then asked to enter the room. Once seated, the audio and video equipment was switched on and the researcher asked the following question: *"For the purpose of the video equipment, please can you confirm that you are happy to be asked some questions?"* to which all participants confirmed. The barrister then said: *"I'm going to ask you some questions about what you said about the video event at interview and I need you to listen carefully, and then answer me truthfully".* He began by asking a set of opening questions which was identical for all participants (see cross-examination protocol). Following this, the main questioning phase of the cross-examination began during which all participants were challenged on the six topics relating to the mock crime event.

After the main questioning phase, the barrister thanked the participants for their time and told them that they responded well to the questions. He explained that some difficult questions were asked and they did well when answering these (see cross-examination protocol). The audio and video equipment was then switched off, the barrister left the room, and the participants were debriefed (see Appendix X). The entire cross-examination process lasted approximately 20-30 minutes, including the time taken for the participants to be briefed and debriefed. The actual cross-examination questioning phase lasted approximately 15 minutes. In each case, the researcher was present in the room throughout the entire process and positioned out of the participant's line of sight to prevent any potential effects of administrator-witness contact on eyewitness performance (Haw & Fisher, 2004).

5.3. Results

The data for this chapter will be approached by initially reporting the descriptive statistics for the main dependent variables across groups. The relationship between the main dependent variables will then be reported followed by the relationship between memory trace strength and resistance on each topic. Subsequently, the results of an ANOVA exploring the effect of condition on overall memory trace strength will be reported

followed by the results of an ANCOVA exploring the effect of condition on overall cede performance, controlling for overall memory trace strength as a covariate. Regarding the reduced sample in the present study, there was no significant correlation between suggestibility scores on the GSS-2 (obtained in Chapter 4) and overall cede performance (r = -.19, p = .23).

5.3.1. Descriptive Statistics for Overall Memory Trace Strength across Groups

Table 5.2 displays the mean, SD, and range for the overall memory trace strength scores obtained across groups. The possible minimum score was 0 and the possible maximum score was 18. A higher overall memory trace strength score indicated a stronger memory trace for correct items of information across all topics. The typical group obtained the highest mean score and the group with sub-clinical anxiety obtained the lowest. The typical group and the group with sub-clinical anxiety obtained the largest range of scores.

Table 5.2: Overall memory trace strength mean scores, SD, and range across groups

	Overall memory trace strength		
Group	*Mean*	*SD*	*Range*
Typical	9.08	2.93	5-15
Anxiety and Depression	9.00	2.07	5-13
Anxiety	7.36	2.85	4-14

5.3.2. Descriptive Statistics for Overall Cede Performance across Groups

Table 5.3 displays the mean, SD, and range for the overall cede performance scores obtained across groups. The possible minimum score was 0 and the possible maximum score was 6. A higher overall cede performance score indicated a higher number of topics on which the participant ceded to the barrister's challenges. The typical group obtained the highest mean score and the group with sub-clinical anxiety and depression obtained the lowest. The group with sub-clinical anxiety obtained the largest range of scores.

Table 5.3: Overall cede performance mean scores, SD, and range across groups

	Overall cede performance		
Group	*Mean*	*SD*	*Range*
Typical	4.15	1.07	2-6
Anxiety and Depression	3.80	.86	2-5
Anxiety	4.14	1.46	1-6

5.3.3. Relationship between Overall Memory Trace Strength and Overall Cede Performance

A bivariate correlational analysis was conducted to explore the relationship between overall memory trace strength and overall cede performance (see Appendix Y). Overall memory trace strength was significantly correlated with overall cede performance, $r = -.41$, $p < .01$. The stronger the overall memory trace was for correct items of information, the fewer topics on which the participant ceded.

5.3.4. Relationship between Memory Trace Strength and Resistance across Topics

A series of bivariate correlational analyses were also conducted to explore the relationship between memory trace strength and resistance across topics (see Appendix Y). A higher topic memory trace strength score indicated a stronger memory trace for correct items of information relating to the topic. A higher topic resistance score indicated greater resistance to the barrister's challenges on the topic. Memory trace strength was significantly correlated with resistance on all topics. The stronger the memory trace was for correct items of information on each topic, the more resistant the participant was to the barrister's challenges. Table 5.4 displays the correlation coefficients and confidence intervals for each topic.

Table 5.4: Topic Memory Trace Strength and Topic Resistance correlation coefficients

		Resistance					
		Physical description	Items of clothing	Surroundings	Time of day/light conditions	Items taken	Order of events
Memory Trace Strength	Physical description	.51**	-	-	-	-	-
	Items of clothing	-	.44**	-	-	-	-
	Surroundings	-	-	.66**	-	-	-
	Time of day/light conditions	-	-	-	.54**	-	-
	Items taken	-	-	-	-	.56**	-
	Order of events	-	-	-	-	-	.56**

** $p < .01$.

5.3.5. Effect of Condition on Overall Memory Trace Strength

A one-way ANOVA was conducted to explore the effect of condition (typical, sub-clinical anxiety and depression, sub-clinical anxiety) on overall memory trace strength (see Appendix Z). The assumptions of the test were met. There was no significant effect of condition on overall memory trace strength, $F(2, 39) = 1.92$, $p = .16$.

5.3.6. Effect of Condition on Overall Cede Performance

An ANCOVA was conducted to explore the effect of condition (typical, sub-clinical anxiety and depression, sub-clinical anxiety) on overall cede performance, controlling for overall memory trace strength as a covariate (see Appendix AA) as this variable was significantly correlated with overall cede performance. The assumptions of the test were met. The covariate, overall memory trace strength, was significantly related to overall cede

performance, $F(1, 38) = 7.89$, $p < .01$, $r = .41$. However, there was no significant effect of condition on overall cede performance after controlling for the effect of overall memory trace strength, $F(2, 38) = 0.48$, $p = .62$. When the covariate was removed and an ANOVA was conducted, there was still no significant effect of condition on overall cede performance ($F(2, 39) = .44$, $p = .65$).

Summary. To summarise, overall memory trace strength and overall cede performance were significantly correlated. In addition, topic memory trace strength and topic resistance were significantly correlated. These findings demonstrate that a stronger memory trace for correct items of information was related to greater resistance to the barrister's challenges. There was no significant effect of witness group on overall memory trace strength or overall cede performance after controlling for the effect of memory trace strength.

5.4. Discussion

The aim of this study was to compare the cross-examination performance of witnesses with no mental health problems and witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, approximately ten months after witnessing an event. Cross-examination performance was measured by 1) how strong their memory trace was for correct items of information and 2) how often they ceded to the cross-examination questions (i.e., accepted that they were wrong about their original evidence at interview). This is the first study within the literature to investigate the cross-examination performance of witnesses with a sub-clinical mental health problem and the method used is a novel approach to cross-examination research. The independent variable was mental health (typical, sub-clinical anxiety and depression, sub-clinical anxiety). The main dependent variables were overall memory trace strength and overall cede performance. There were two additional dependent variables which were topic memory trace strength score and topic resistance score.

The findings revealed a significant relationship between the dependent variables. As overall memory trace strengthened (i.e., participants demonstrated a stronger memory trace for correct items of information across all topics), overall cede performance decreased (i.e., participants ceded to the barrister's challenges on fewer topics). The same pattern of results emerged when the relationship between memory trace strength and resistance was examined on each topic. These findings are consistent with two theories of memory. The

first is the memory trace strength theory of suggestibility which proposes that stronger memories are more likely to resist suggestibility than weaker memories (Pezdek & Roe, 1995). The second is the fuzzy trace theory which suggests that "misleading information degrades memory by either altering the trace or by preventing its retrieval (or both), with the amount of degradation being dependent upon the current strength of memory for the original event details" (Holliday, Douglas, & Hayes, 1999, p. 445). According to these two theories, the finding from the present study that participants with a stronger memory trace for the crime event were more resistant to the barrister's suggestions that they were wrong about their evidence is to be expected.

With regard to overall memory trace strength across groups, there was no significant effect of condition found. On one hand, this is surprising as there is a large body of research to suggest that general memory performance is negatively affected by mental health (e.g., Gallassi et al., 2001; Pacheco-Unguetti et al., 2011; Plana et al., 2014). One may have therefore expected the participants with a mental health problem in this study to have demonstrated a weaker memory trace for the crime event. Also, the cross-examinations took place after a lengthy delay during which the memory trace is likely to have decayed and/or been contaminated by interference (Henderson, 2005). Given that general memory capabilities are affected by mental health and delayed memory recall is impaired to a greater extent in individuals with depression (e.g., Ramponi et al., 2010; Vythilingam et al., 2004) and anxiety (e.g., Butters et al., 2011; Crespo et al., 2015), the findings of this study are somewhat unexpected. On the other hand, study 2 (see Chapter 4) revealed no significant group differences in memory recall for correct information at interview which is in line with the present findings. One of the original predictions of the present study was that similar findings may emerge to those revealed in study 2. However, it is important to highlight that the participants did not have a formal mental health diagnosis and consequently the findings cannot be generalised to severe cases. There may be differences in the memory recall performance of individuals with a formal diagnosis.

With regard to overall cede performance across groups, there was also no significant effect of condition found after controlling for the effect of overall memory trace strength. When the participants were challenged on their evidence, the groups with sub-clinical anxiety and depression, and sub-clinical anxiety, did not cede to the barrister's suggestions that they were wrong significantly more than the typical group. It was originally predicted that their cross-examination performance would be either worse than or equivalent to the typical

group; the latter being based on the findings of study 2 (see Chapter 4). The present findings support the latter prediction. This suggests that, as well as being just as accurate in memory recall at interview as typical witnesses, witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, perform just as well at cross-examination. The present findings correspond to those of a study conducted on children with and without an ID which used a similar time delay to the delay used in the present study (and real-life cases) between interview and cross-examination, and revealed no group differences in cross-examination performance (Bettenay et al., 2014). However, care should be taken when comparing the present findings to those from studies involving children as the samples are very different.

Furthermore, participants in the present study were questioned about the crime event in a suggestive way in which misleading questions were used and much of the literature has demonstrated that misleading post-event information can significantly impair memory (e.g., Gudjonsson & Henry, 2003; Kebbell et al., 2004; Loftus, 1975; Zaragoza et al., 2007). The findings of cross-examination studies have shown that misleading questions can impede witness accuracy (e.g., Kebbell & Giles, 2000; Kebbell & Johnson, 2000; Wheatcroft, Wagstaff, & Kebbell, 2004) with witnesses often recalling details that represent the misinformation rather than details of the actual event (e.g., Jaschinski & Wentura, 2002; Zaragoza et al., 2007). It appears that misleading post-event information can contaminate memory to a greater degree in vulnerable persons (e.g., Gudjonsson & Henry, 2003; Kebbell et al., 2004; Ridley et al., 2002). However, the present study contradicts such findings as the participants with a mental health problem were not affected by misleading information significantly more than the typical participants. There is currently no research that has explored the effect of misleading information on witnesses with a mental health problem specifically at cross-examination but there is some literature on the effects of mental health on suggestibility more generally. In terms of depression, the literature is non-existent. However, regarding anxiety, Ridley (2003) found that state anxiety weakened the effect of misleading information with high state anxiety being associated with reductions in suggestibility. In contrast, trait anxiety, which is the form of anxiety that is relevant to this thesis, was associated with higher levels of suggestibility (Ridley, 2003). Yet, in the present study, participants with trait anxiety were no more suggestible than their typical counterparts. This finding is somewhat surprising given that the mean trait anxiety scores for the groups with sub-clinical anxiety and depression, and sub-clinical anxiety, in the present study were higher than those in the study conducted by Ridley (2003).

Nevertheless, with regard to the reduced sample in the present study, there was no significant effect of mental health on suggestibility at interview in study 2 (see Chapter 4) using the Gudjonsson Suggestibility Scale-2 (GSS-2) (Gudjonsson, 1997) which is consistent with the present findings.

There are several limitations of the present study, some of which are similar to those outlined in study 2 (see Chapter 4) as the participants took part in both studies. First, the participants were not totally representative of the general population as they were largely students. Second, the groups with sub-clinical anxiety and depression, and sub-clinical anxiety, did not have a formal mental health diagnosis and consequently different findings may have emerged if more severe cases of anxiety and depression had been explored. Third, the barristers were approachable and the context in which the cross-examinations took place was familiar to most of the participants as they were conducted at the University of Winchester. Therefore, the potential trauma of a real court case could not be replicated which limits the extent to which the findings can be generalised to real cases. Additionally, although positioned out of view, the researcher was present in the room at all times which may have caused the participants to feel more at ease than if they were partaking in a real case. Furthermore, the length of the cross-examinations was on average 15 minutes. It seems that there is no specific time frame that fits all cross-examinations as it is dependent upon the circumstances of the case (Clark, Dekle, & Bailey, 2015). Whilst there is no literature regarding how long a typical cross-examination of a vulnerable adult with a mental health problem lasts, the ABE guidance outlines that some vulnerable witnesses may need breaks whilst giving their evidence (Ministry of Justice, 2011) which indicates that real cases are likely to be lengthy. However, for ethical reasons, it would not have been possible to replicate the length of a real cross-examination. One may argue that the cross-examination performance across groups may have been different in this study had the cross-examinations been longer and more severe mental health cases had been examined. Finally, it may have been useful to measure the participants' stress levels and physiological reactions whilst being cross-examined as the process in itself may have induced anxiety. This needs to be considered for future research.

To conclude, the cross-examination performance of the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, was equivalent to that of the typical witnesses with no mental health problems. This indicates that their memory trace for the original crime event was just as strong and they were just as resistant to the barrister's suggestions

that they were wrong about their evidence. Such findings contradict previous research involving other vulnerable groups but are consistent with the findings of study 2 (see Chapter 4) which found no significant group differences in memory accuracy and suggestibility at the interview stage.

Chapter 6

Study 4: Mock Jurors' Perceptions of Eyewitnesses with Sub-Clinical Anxiety and Depression, and Sub-Clinical Anxiety

Abstract

The aim of this study was to assess mock jurors' perceptions of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, compared to a typical witness with no mental health problems either with or without the provision of knowledge regarding the witness's mental health status. One hundred and twenty participants viewed a witness giving evidence at interview and cross-examination. Participants were assigned to one of six groups. Two groups viewed a witness with sub-clinical anxiety and depression; one of which was informed of their mental health problem. Two groups viewed a witness with sub-clinical anxiety; one of which was informed of their mental health problem. Two groups viewed a typical witness; one of which was informed that they did not have a mental health problem. Overall, the witness with sub-clinical anxiety and depression was perceived to be less credible than the other two witnesses and the mock jurors were more inclined to consider the defendants to be not guilty as a result of viewing the witnesses with a mental health problem. Both sets of findings were irrespective of whether the mock jurors were informed of the witness's mental health status. The implications of these findings are discussed in relation to the criminal justice process.

6.1. Introduction

Within Chapter 2 of this thesis, a study was presented which addressed the perceived reliability and credibility of witnesses with a mental health problem from the perspective of legal professionals working at various stages of the criminal justice process. However, along with assessing legal professionals' perceptions, it is also important to determine how such witnesses are perceived by jury members. The UK has an adversarial judicial system in which a prosecuting advocate and a defense advocate argue their points before an impartial group of people, known as a jury, who attempt to determine the truth. Under the Contempt of Court Act (1981), the members of a jury in the UK cannot discuss how they reach their decision and therefore it is impossible to know which factors may influence the decision-making process. However, understanding the factors that may affect

their decision making is important in determining whether juries are fair. If, for example, jurors use their own biases in place of the witness's actual testimony to reach their decision, this could result in an unfair trial. Research has shown that when jurors perceive a witness to lack credibility, they are less likely to decide that the defendant is guilty (Pica, Sheahan, Mesesan, & Pozzulo, 2017). There are several factors that appear to influence jurors' perceptions of credibility such as eye contact (e.g., Field et al., 2010), confidence (e.g., Dodson & Dobolyi, 2015), and emotion (e.g., Cooper, Quas, & Cleveland, 2014) which suggests that jurors do not rely exclusively on the content of the witness's testimony but use other factors on which to base their decision.

A further factor that has been shown to affect jurors' decision making is vulnerability (e.g., Allison et al., 2006; Bruer & Pozzulo, 2012; Henry et al., 2011). Within the literature, there are a number of studies that have explored jurors' perceptions of testimony provided by vulnerable witnesses and the research seems to suggest that such witnesses are perceived differently to typical witnesses. For example, child witnesses are perceived with less integrity than adult witnesses (e.g., Bruer & Pozzulo, 2012) and children with an ID are seen to be less credible than typically developing children (e.g., Henry et al., 2011). There is also evidence to suggest that jurors perceive elderly adults to be less believable than their younger counterparts (e.g., Allison et al., 2006) and are reluctant to rely on the evidence provided by adults with an ID (e.g., Stobbs & Kebbell, 2003). Nevertheless, literature on jurors' perceptions of witnesses with a mental health problem is extremely limited.

As mental health is a growing public health concern (Mental Health Foundation, 2019a) and it is common for individuals with a mental health problem to encounter the CJS (Prison Reform Trust and Rethink Mental Illness, 2013), it is crucial to determine how they are perceived as witnesses within the context of a jury. It is even more crucial that jurors' perceptions of anxiety and depression are explored given that these are amongst the most prevalent mental health problems within society (Mental Health Foundation, 2019b). As outlined in this thesis, there is very little empirical research on the performance of witnesses with a mental health problem when providing evidence within a criminal justice context. With studies 2 and 3 (see Chapters 4 and 5) indicating that the testimonies of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, are just as accurate as those provided by witnesses with no mental health problems, it is crucial to understand how jurors perceive their evidence. This is important because eyewitness

testimony is one of the most influential pieces of evidence presented to a jury (Brewer & Burke, 2002).

There is a large body of literature to suggest that individuals with a mental health problem experience public stigma (i.e., stereotypes, prejudices, and discrimination). Approximately nine out of ten individuals with a mental health problem experience mental health related stigma (Corker et al., 2016) and are less likely to seek help and support as a result (Clement et al., 2015). Due to members of the public having stereotypical views about mental health and how it affects people (Mental Health Foundation, 2019c), the credibility of witnesses with a mental health problem could be questioned by jurors. Indeed, there is research to suggest that the beliefs of jurors can be influenced by stereotypes which can subsequently affect their judgements about the credibility of a witness (Peled et al., 2004). Whilst, in real-life cases, jurors may or may not be aware that a witness has got a mental health problem when asked to evaluate their evidence, research has shown that the mere knowledge of a witness having a vulnerability can bias jurors' perceptions of the credibility of their testimony, irrespective of the quality of their evidence (Peled et al., 2004). Therefore, the present study focuses on whether providing mock jurors with the knowledge that a witness has got a mental health problem influences their perceptions of the witness's credibility. One may argue that providing jurors with information about a witness's mental health problem could cause them to perceive the credibility of the witness less favourably given the stigma associated with mental health. On the other hand, previous research with other vulnerable groups has demonstrated that the provision of additional information can in fact help to reduce unfair biases held about their credibility. Sasson and Morrison (2017), for example, found that notifying typically developing adult observers of an individual's diagnosis of autism led to the observers judging the individual more favourably. Similar findings have been revealed with other diagnoses such as Alzheimer's disease and major depression (e.g., Wadley & Haley, 2001). The findings of the previous two chapters of this thesis suggest that the accuracy and reliability of testimony provided by a witness with sub-clinical anxiety and depression, or sub-clinical anxiety, is not necessarily poorer than that of a typical witness. Consequently, it is vital that jurors are not disregarding the evidence of a potentially credible witness because of stereotypes about mental health. Within the literature, most of the mock juror studies have focused on the interview stage of the legal process using interview transcripts (e.g., Bruer & Pozzulo, 2012; Stobbs & Kebbell, 2003) whereas the present study is based on video material of witness interviews and cross-examinations, making the research more ecologically valid.

6.1.1. The Present Study

Based on the fact that the literature on mental health and its effects on eyewitness memory is sparse and there is a strong stigma attached to mental health, it is likely that mock jurors will have biased perceptions of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety. By informing mock jurors that a witness has got a mental health problem, prior to hearing their evidence, it is expected that their perceptions will be influenced. It is also expected that mock jurors' perceptions of a witness with no mental health problems will be unaffected by whether or not they are informed that the witness does not have a mental health problem. The interviews and cross-examinations used in the present study were taken from studies 2 and 3 of this thesis in which adults with sub-clinical anxiety and depression, and sub-clinical anxiety, and typical adults with no mental health problems were asked questions about a previously witnessed mock staged crime.

6.2. Method

6.2.1. Design

The study was a 3 x 2 between participants design. The first independent variable was mental health status of the witness (no mental health problems, sub-clinical anxiety and depression, sub-clinical anxiety). The second independent variable was knowledge (whether or not the mock jurors were informed of the witness's mental health status). There were ten dependent variables which measured the mock jurors' perceptions of the witness at interview. Perceptions were measured in terms of how accurate, convincing, confident (in their account), confident (in their general demeanour), competent, honest, and believable the witness appeared as well as their completeness of testimony, level of cognitive functioning, and capability to testify. Responses were measured on a 7-point Likert scale with lower scores indicating, for example, less accurate or convincing. These ten dependent variables were also used to measure the mock jurors' perceptions of the witness at cross-examination. There were three further dependent variables which measured their perceptions of the witness's credibility at interview, at cross-examination, and overall (across both interview and cross-examination). In addition, the mock jurors' verdict was measured in terms of whether they perceived the defendants to be guilty or

not guilty on the basis of the witness's testimony and qualitative responses were obtained with regard to how the witness's credibility might have been improved.

6.2.2. Participants

A total of 120 jury eligible individuals (mean age = 45.21, *SD* = 16.32) comprising 72 females and 48 males took part in the study on a voluntary basis. For a MANOVA examining the effect of the independent variable (witness's mental health status) on mock jurors' perceptions, a post hoc power analysis on the sample of 120 was conducted using the software package, GPower (Faul et al., 2007). The recommended effect sizes used were as follows: small (.10), medium (.30), and large (.50; see Cohen, 1988). The alpha level used for this analysis was $p < .05$. A post hoc analysis revealed that the statistical power for this study was 1.0. Thus, there was adequate power at the large effect size. In each group, there were 20 participants (twelve females and eight males). Two groups viewed a witness with sub-clinical anxiety and depression; one of which was informed of their mental health problem. Two groups viewed a witness with sub-clinical anxiety; one of which was informed of their mental health problem. Two groups viewed a typical witness; one of which was informed that they did not have a mental health problem. Table 6.1 presents the total number, mean age, SD, and age range for males and females in each group. There was no effect of group on age, $F(5, 114) = .20$, $p = .96$. The majority of the participants were White British. There were four participants from a different ethnic background (Asian British, Mixed White and Asian, Mixed White and Black Caribbean, and Other White Background) and these four participants were in different experimental conditions (typical informed, typical uninformed, anxiety and depression informed, and anxiety uninformed). All participants were recruited from the local community in Winchester and the surrounding areas via e-mail and telephone.

Table 6.1: Total number, mean age (SD), and age range for males and females in each group

	Males			Females		
Group	*N*	*Mean*	*Range*	*N*	*Mean*	*Range*
Anxiety and Depression (informed)	8	48.00 *(15.44)*	27-73	12	41.33 *(15.12)*	20-64
Anxiety (informed)	8	49.88 *(19.09)*	26-71	12	44.50 *(16.82)*	22-69
Typical (informed)	8	45.00 *(20.28)*	22-74	12	48.75 *(15.51)*	20-69
Anxiety and Depression (uninformed)	8	48.63 *(16.17)*	25-68	12	44.42 *(17.95)*	22-74
Anxiety (uninformed)	8	38.63 *(14.04)*	26-62	12	46.33 *(18.24)*	23-74
Typical (uninformed)	8	41.63 *(15.63)*	22-67	12	45.58 *(16.62)*	26-70

6.2.3. Materials

Video Material. A total of six videos were selected for the present study which were taken from studies 2 and 3 of this thesis. All participants on the videos provided their consent to be recorded. The video material comprised one interview and one cross-examination of three separate mock witnesses: 1) a typical witness with no mental health problems, 2) a witness with sub-clinical anxiety and depression, and 3) a witness with sub-clinical anxiety. Participants were each shown two videos: one video of a witness at interview and one video of the same witness at cross-examination. The videos were selected using specific criteria to ensure that they were matched as much as possible. All witnesses were female, White British, aged between 19 and 24 years, and spoke English as their first language. These criteria represented the majority of the mock witnesses in studies 2 and 3. The interviews were similar in length of time (between six minutes 21 seconds and six minutes 42 seconds) and comprised a similar number of correct items of information recalled by the mock witnesses (between 33 and 39 items). In addition, the cross-examinations were similar in length of time (between nine minutes 32 seconds and nine minutes 56 seconds) and all witnesses were cross-examined by the same barrister.

Questionnaire. There was one questionnaire used for this study which had a different introduction according to participant condition (see Appendix BB). For the informed groups, the questionnaire included one of the following introductory statements: *"The witness has anxiety and depression", "The witness has anxiety",* or *"The witness does not have a mental health problem".* For the uninformed groups, no information about the witness's mental health status was given. The questionnaire was divided into three main sections. The first section comprised a set of ten scaled-response questions relating to the witness at interview (first video clip). Participants were asked to circle a number between one and seven that they felt best represented 1) how accurate the witness's account was, 2) how convincing the witness was in their account, 3) how confident the witness appeared in what they said in their account, 4) how confident the witness appeared in their general demeanour, 5) how competent the witness appeared in their account, 6) how honest the witness appeared, 7) how believable the witness appeared, 8) how complete the witness's account appeared, 9) the witness's overall level of cognitive functioning (i.e., their ability to think, reason and remember), and 10) the witness's capability to testify. A lower score on the 7-point Likert scale indicated, for example, less accurate or convincing. The second section comprised the same set of ten scaled-response questions but relating to the witness at cross-examination (second video clip). The third section included three further scaled-response questions relating to perceived credibility of the witness at interview, at cross-examination, and overall (taking into account both videos). There was an optional question at the end of each section asking participants how the witness's credibility might be improved. At the end of the questionnaire, participants were asked to indicate whether they believed the defendants to be guilty or not guilty on the basis of the witness testimony (if all other evidence was equal). Finally, the informed participants who viewed the witnesses with a mental health problem were asked if they remembered that the witness had anxiety and depression, or anxiety, in order to check that the manipulation was successful (see Appendix BB). All participants responded with 'yes' to this question.

6.2.4. Procedure

All participants took part in the present study in a quiet, convenient location such as their own home or an office in their workplace. Initially, they were given the participant information sheet to read (see Appendix CC). They were then informed of the purpose of taking part and that there were no risks associated with their participation. They were also told that their participation was entirely voluntary and they may withdraw from the study

at any time up until 14 days after the study without penalty. They were informed that no names would be attached to the data and only the researchers involved with the study would have access to the data. It was made clear that participant details would be coded and no identifiable personal information would be stored on the computer. If they were happy to continue, they were asked to provide written consent (see Appendix DD).

After providing consent, participants were given a brief explanation of the running order of the study. They were informed that they would be viewing a video interview and a video cross-examination provided by a witness to a mild mock crime event and asked some questions about the accuracy and reliability of their evidence. They were then asked to read the eligibility for jury service criteria on the first page of the questionnaire (see Appendix BB) to check that they were eligible for jury service in the UK and provide a response by circling 'yes' or 'no'. All participants responded with 'yes'. They were also asked to provide some demographic details such as age, gender, and ethnicity. They were then asked to read the statement at the bottom of the page (*"Now we would like you to watch a short video clip of a witness being interviewed about an event they have seen"*). For the informed groups, information about the witness's mental health status was given. All participants were asked to close the questionnaire and refrain from opening it again until after the video clip had been shown.

The video clip of the witness at interview was shown first. After viewing the video clip, participants were asked to complete the first section of the questionnaire (see materials section). At the end of this section, the questionnaire included the following statement: *"Now we would like you to watch a short video clip of the same witness being cross-examined by a barrister".* The video clip of the witness at cross-examination was shown. After viewing the video clip, participants were asked to complete the second section of the questionnaire (see materials section). Once this section had been completed, participants were instructed to complete the third section of the questionnaire (see materials section). Finally, all participants were asked to respond to the following question: *"If all other evidence is equal; on the basis of this witness testimony, do you think the defendants are guilty or not guilty?"* They were asked to circle 'guilty' or 'not guilty'. For the informed groups who viewed the video clips of the witnesses with a mental health problem, participants were asked if they remembered that the witness had anxiety and depression, or anxiety. Once the questionnaire had been completed, the participants were thanked for

their time and debriefed (see Appendix EE). The study lasted approximately 60 minutes, including the time taken for the participants to be briefed and debriefed.

6.3. Results

The data for this chapter will be approached by initially reporting the results of a MANOVA which explored the effects of the witness's mental health status (typical, sub-clinical anxiety and depression, sub-clinical anxiety) and knowledge (informed or uninformed) on the interview questionnaire items. Following this, the results of a MANOVA which explored the effects of the witness's mental health status (typical, sub-clinical anxiety and depression, sub-clinical anxiety) and knowledge (informed or uninformed) on the cross-examination questionnaire items will be reported. Subsequently, the results of a one-way ANOVA will be reported which examined the effects of the two independent variables described above on mock jurors' perceptions of the witness's overall credibility (across both interview and cross-examination). Then, the results of a loglinear analysis will be reported which explored the associations between 1) the witness's mental health status, 2) whether mock jurors were informed of the witness's mental health status, and 3) whether they considered the defendants to be guilty or not guilty (verdict). Finally, qualitative responses from the questionnaires will be reported in terms of how witness credibility could be improved. Initial explorations of the data indicated that the dependent variables were normally distributed and there were no significant outliers. Multicollinearity describes a situation in which two or more variables are very closely linearly related (Field, 2018). To avoid multicollinearity, Field (2018) suggests eliminating one (or more) variables when the correlation between two variables is greater than .80 ($r > .80$). In the present study, all correlation scores were below .80 and therefore no variables were eliminated from the analyses.

6.3.1. Effect of Condition and Knowledge on Interview Items

A MANOVA was conducted to examine the effects of the witness's mental health status (typical, sub-clinical anxiety and depression, sub-clinical anxiety) and knowledge (informed or uninformed) on mock jurors' perceptions of the witness at interview (see Appendix FF). Although the assumption of homogeneity was not met for three of the dependent variables (confidence in account, believability, and capability to testify; see Appendix FF), there was no need to transform the data as the sample sizes were equal

(Blanca et al., 2017; Field, 2018). In terms of interpreting the MANOVA results, Pillai's trace statistic was used because it is the most powerful and robust (Field, 2018). Using Pillai's trace, there was a significant main effect of the witness's mental health status on mock jurors' perceptions, $V = 0.33$, $F(22, 210) = 1.89$, $p < .05$, $\eta p^2 = .17$. Post hoc comparisons using the Tukey HSD test indicated that there was a significant difference ($p < .05$) between perceptions of the typical witness and the witness with sub-clinical anxiety and depression on all of the interview questionnaire items. For each item, the mock jurors' perceptions were more positive for the typical witness (see Table 6.2 for means and SDs). There was also a significant difference ($p < .05$) between perceptions of the witness with sub-clinical anxiety and the witness with sub-clinical anxiety and depression on the following questionnaire items: accurate, convincing, confident (in account), competent, believable, credible, completeness of testimony, and cognitive functioning. For each item, the mock jurors' perceptions were more positive for the witness with sub-clinical anxiety (see Table 6.2 for means and SDs). There was no significant main effect of knowledge on mock jurors' perceptions, $V = 0.12$, $F(11, 104) = 1.25$, $p = .27$. There was also no significant interaction between the witness's mental health status and knowledge on mock jurors' perceptions, $V = 0.19$, $F(22, 210) = 0.98$, $p = .50$. Table 6.2 displays the mean and SD of scores obtained across groups for the interview items of the questionnaire.

Table 6.2: Mean score (SD) for the interview questionnaire items across groups

	Anxiety and Depression			Anxiety			Typical		
	Informed	Uninformed	Overall	Informed	Uninformed	Overall	Informed	Uninformed	Overall
Item	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
Accurate	4.25 *(1.02)*	4.10 *(.79)*	4.18 *(.90)*	5.10 *(1.21)*	4.85 *(.99)*	4.98 *(1.10)*	5.20 *(1.12)*	4.90 *(.85)*	5.05 *(.99)*
Convincing	3.80 *(1.61)*	3.80 *(1.24)*	3.80 *(1.42)*	4.75 *(1.33)*	4.40 *(1.14)*	4.58 *(1.29)*	4.90 *(.85)*	4.95 *(1.36)*	4.93 *(1.12)*
Confident (account)	3.50 *(1.19)*	3.45 *(1.54)*	3.48 *(1.36)*	4.60 *(1.00)*	4.50 *(.83)*	4.55 *(.90)*	4.60 *(1.14)*	5.00 *(1.17)*	4.80 *(1.16)*
Confident (general)	3.20 *(1.24)*	3.15 *(1.50)*	3.18 *(1.36)*	3.70 *(1.38)*	3.90 *(1.17)*	3.80 *(1.27)*	4.15 *(1.53)*	4.00 *(1.59)*	4.08 *(1.54)*
Competent	3.80 *(1.20)*	4.05 *(1.15)*	3.93 *(1.16)*	4.75 *(1.16)*	4.45 *(1.15)*	4.60 *(1.15)*	4.90 *(.97)*	4.80 *(1.24)*	4.85 *(1.10)*
Honest	5.40 *(1.23)*	5.35 *(.81)*	5.38 *(1.03)*	5.65 *(1.42)*	5.85 *(.88)*	5.75 *(1.17)*	6.05 *(1.00)*	5.95 *(1.00)*	6.00 *(.99)*
Believable	4.25 *(1.68)*	4.45 *(1.05)*	4.35 *(1.39)*	5.40 *(1.10)*	5.50 *(.83)*	5.45 *(.96)*	5.50 *(1.10)*	5.50 *(1.15)*	5.50 *(1.11)*
Complete	3.60 *(1.31)*	3.40 *(1.23)*	3.50 *(1.26)*	4.50 *(1.32)*	4.05 *(1.10)*	4.28 *(1.22)*	4.40 *(1.35)*	4.30 *(1.38)*	4.35 *(1.35)*
Cognitive functioning	3.75 *(1.33)*	4.55 *(1.70)*	4.15 *(1.56)*	5.15 *(.93)*	4.80 *(1.20)*	4.98 *(1.07)*	5.35 *(1.14)*	5.05 *(1.43)*	5.20 *(1.29)*
Capability to testify	4.25 *(1.16)*	4.20 *(1.74)*	4.23 *(1.46)*	5.00 *(.97)*	4.80 *(1.15)*	4.90 *(1.06)*	5.30 *(1.26)*	4.75 *(1.52)*	5.03 *(1.41)*
Credible	3.90 *(1.37)*	4.20 *(1.20)*	4.05 *(1.28)*	4.95 *(1.00)*	5.00 *(.80)*	4.98 *(.89)*	5.00 *(1.21)*	5.10 *(1.12)*	5.05 *(1.15)*

6.3.2. Effect of Condition and Knowledge on Cross-Examination Items

A MANOVA was conducted to examine the effects of the witness's mental health status (typical, sub-clinical anxiety and depression, sub-clinical anxiety) and knowledge (informed or uninformed) on mock jurors' perceptions of the witness at cross-examination (see Appendix FF). The assumption of homogeneity was met for all dependent variables and again Pillai's trace statistic was used because it is the most powerful and robust (Field, 2018). Using Pillai's trace, there was no significant main effect of the witness's mental health status on mock jurors' perceptions, $V = 0.20$, $F(22, 210) = 1.05$, $p = .41$. There was also no significant main effect of knowledge on mock jurors' perceptions, $V = 0.15$, $F(11, 104) = 1.60$, $p = .11$. However, there was a significant interaction between the witness's mental health status and knowledge on mock jurors' perceptions, $V = 0.37$, $F(22, 210) = 2.20$, $p < .01$, $\eta p^2 = .19$. In each case, the difference emerged when the mock jurors were informed about the mental health status of the witness. When informed, there was a significant difference ($p < .05$) between perceptions of the accuracy of the typical witness ($M = 4.75$, $SD = 1.16$) and the witness with sub-clinical anxiety and depression ($M = 3.80$, $SD = 1.32$) with the mock jurors perceiving the typical witness to be more accurate. When informed, there was also a significant difference ($p < .01$) between perceptions of the cognitive functioning of the typical witness ($M = 5.50$, $SD = 1.10$) and the witness with sub-clinical anxiety and depression ($M = 4.20$, $SD = 1.64$), again with the mock jurors perceiving the typical witness to have better cognitive functioning. Furthermore, when informed, there was a significant difference ($p < .05$) between perceptions of the honesty of the typical witness ($M = 6.20$, $SD = .70$) and the witness with sub-clinical anxiety ($M = 5.40$, $SD = 1.47$), again with the mock jurors perceiving the typical witness to be more honest. Table 6.3 displays the mean and SD of scores obtained across groups for the cross-examination items of the questionnaire.

Table 6.3: Mean score (SD) for the cross-examination questionnaire items across groups

	Anxiety and Depression			Anxiety			Typical		
	Informed	Uninformed	Overall	Informed	Uninformed	Overall	Informed	Uninformed	Overall
Item	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*	*Mean*
Accurate	3.80 *(1.32)*	4.20 *(1.15)*	4.00 *(1.24)*	3.95 *(1.19)*	3.90 *(1.07)*	3.93 *(1.12)*	4.75 *(1.16)*	4.25 *(1.29)*	4.50 *(1.24)*
Convincing	4.00 *(1.45)*	4.40 *(1.14)*	4.20 *(1.31)*	4.05 *(1.40)*	3.80 *(1.24)*	3.93 *(1.31)*	4.65 *(1.27)*	4.35 *(1.42)*	4.50 *(1.34)*
Confident (account)	4.40 *(1.27)*	4.20 *(1.28)*	4.30 *(1.27)*	3.80 *(1.74)*	4.25 *(1.12)*	4.03 *(1.46)*	4.75 *(1.21)*	4.40 *(1.47)*	4.58 *(1.34)*
Confident (general)	5.05 *(1.10)*	4.50 *(1.24)*	4.78 *(1.19)*	4.05 *(1.57)*	4.55 *(1.23)*	4.30 *(1.42)*	4.85 *(1.31)*	4.25 *(1.41)*	4.55 *(1.38)*
Competent	4.40 *(1.27)*	4.25 *(1.21)*	4.33 *(1.23)*	3.95 *(1.47)*	4.35 *(1.35)*	4.15 *(1.41)*	4.65 *(1.23)*	4.60 *(1.43)*	4.63 *(1.31)*
Honest	6.00 *(.92)*	5.65 *(.81)*	5.83 *(.87)*	5.40 *(1.47)*	5.60 *(.88)*	5.50 *(1.20)*	6.20 *(.70)*	5.90 *(1.12)*	6.05 *(.93)*
Believable	4.80 *(1.32)*	4.90 *(1.02)*	4.85 *(1.17)*	4.85 *(1.31)*	4.70 *(1.08)*	4.78 *(1.19)*	5.55 *(.89)*	5.30 *(1.26)*	5.43 *(1.08)*
Complete	3.15 *(1.27)*	3.55 *(1.40)*	3.35 *(1.33)*	3.35 *(.99)*	3.35 *(.81)*	3.35 *(.89)*	4.00 *(1.21)*	3.65 *(1.50)*	3.83 *(1.36)*
Cognitive functioning	4.20 *(1.64)*	4.90 *(1.25)*	4.55 *(1.48)*	4.90 *(1.29)*	4.65 *(1.31)*	4.78 *(1.29)*	5.50 *(1.10)*	4.90 *(1.37)*	5.20 *(1.27)*
Capability to testify	4.95 *(1.05)*	4.35 *(1.69)*	4.65 *(1.42)*	4.60 *(1.60)*	4.65 *(1.50)*	4.63 *(1.53)*	5.60 *(1.31)*	4.90 *(1.59)*	5.25 *(1.48)*
Credible	4.40 *(1.50)*	4.05 *(1.32)*	4.23 *(1.41)*	4.30 *(1.22)*	3.75 *(1.29)*	4.03 *(1.27)*	4.90 *(1.21)*	4.40 *(1.39)*	4.65 *(1.31)*

6.3.3. Effect of Condition and Knowledge on Overall Credibility

A 3 x 2 between participants ANOVA was conducted to examine the effects of the witness's mental health status (typical, sub-clinical anxiety and depression, sub-clinical anxiety) and knowledge (informed or uninformed) on mock jurors' perceptions of the witness's overall credibility across both interview and cross-examination (see Appendix GG). There was a significant main effect of the witness's mental health status on mock jurors' perceptions, $F(2, 114) = 5.44$, $p < .01$, $\eta p^2 = .09$. Post hoc comparisons using the Tukey HSD test indicated that there was a significant difference ($p < .01$) between perceptions of the typical witness ($M = 4.88$, $SD = 1.11$) and the witness with sub-clinical anxiety and depression ($M = 4.05$, $SD = 1.30$) with the mock jurors perceiving the typical witness to be more credible. There was no significant difference ($p = .08$) between perceptions of the typical witness ($M = 4.88$, $SD = 1.11$) and the witness with sub-clinical anxiety ($M = 4.32$, $SD = .97$) and no significant difference ($p = .53$) between perceptions of the witness with sub-clinical anxiety and depression ($M = 4.05$, $SD = 1.30$) and the witness with sub-clinical anxiety ($M = 4.32$, $SD = .97$). There was no significant main effect of knowledge on mock jurors' perceptions, $F(1, 114) = 0.93$, $p = .34$. There was also no significant interaction between the witness's mental health status and knowledge on mock jurors' perceptions, $F(2, 114) = 0.75$, $p = .47$.

6.3.4. Associations between Condition, Knowledge, and Verdict

A three-way loglinear analysis was conducted to explore the associations between mental health status of the witness (typical, sub-clinical anxiety and depression, sub-clinical anxiety), knowledge (informed or uninformed), and verdict (guilty or not guilty) (see Appendix HH). The analysis produced a final model that retained one higher-order effect. The two-way interaction between mental health status of the witness and verdict was significant, $\chi^2 (11) = 26.93$, $p < .05$. Table 6.4 displays the frequency counts for guilty/not guilty decisions based on each witness. To further examine this interaction, a Chi-square test was performed (see Appendix II). The analysis found a significant association between mental health status of the witness and verdict, $\chi^2 (2) = 9.98$, $p < .01$. Eighty-five percent of mock jurors who viewed the typical witness considered the defendants to be guilty compared with 62.5% of mock jurors who viewed the witness with sub-clinical anxiety and depression and 52.5% of mock jurors who viewed the witness with sub-clinical anxiety.

Field (2018) states that, in order to decompose what contributes to the overall association that the Chi-square statistic measures, it is important to examine the individual standardized residuals. If the value lies outside of +/-1.96 then it is significant at $p < .05$ (Field, 2018). The Chi-square test revealed one standardized residual that was greater than 1.96. The mock jurors who viewed the typical witness made significantly fewer not guilty verdicts than the mock jurors who viewed the other two witnesses ($z = -2.0$), i.e., the mock jurors who viewed the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, were more inclined to consider the defendants to be not guilty on the basis of the witness testimony.

Table 6.4: Frequency counts for guilty/not guilty decisions based on each witness

	Guilty	Not guilty
Typical	34	6
Anxiety and Depression	25	15
Anxiety	21	19

6.3.5 Qualitative Responses to Improving Eyewitness Credibility

After viewing the witness at interview, mock jurors were asked how they thought the witness's credibility might be improved. Eighty-eight of the 120 mock jurors (73.3%) provided a response to this free recall question with a similar number of mock jurors responding for each witness (typical: 27; sub-clinical anxiety and depression: 33; sub-clinical anxiety: 28) and a near equal divide between the informed and uninformed conditions (informed: 43; uninformed: 45). Irrespective of the witness's mental health status and whether mock jurors were informed of their mental health problem, the most common suggestion, provided by 45.5% of the mock jurors who responded, was for the witness to provide more detail. Other frequently mentioned suggestions included the witness having more confidence in what she was saying (27.3%) and holding herself more confidently (26.1%). The same free recall question was put to the mock jurors after viewing the witness at cross-examination. Fifty-four of the 120 mock jurors (45%) provided a

response with a similar number of mock jurors responding for each witness (typical: 16; sub-clinical anxiety and depression: 21; sub-clinical anxiety: 17) and a near equal divide between the informed and uninformed conditions (informed: 28; uninformed: 26). The most common suggestion, provided by 61.1% of the mock jurors who responded, was for the witness to have more confidence in what she was saying, followed by the witness providing a clearer account (18.5%). In terms of how the witness's overall credibility (across both interview and cross-examination) could be improved, 44 of the 120 mock jurors (36.7%) provided a response with a similar number of mock jurors responding for each witness (typical: 14; sub-clinical anxiety and depression: 13; sub-clinical anxiety: 17) and a near equal divide between the informed and uninformed conditions (informed: 23; uninformed: 21). The most common suggestion, provided by 40.9% of the mock jurors who responded, was for the witness to be more consistent in her responses between the interview and cross-examination.

With regard to the interview, when mock jurors were uninformed of the witness's mental health status, providing more detail remained the most commonly mentioned suggestion for improving credibility for both the typical witness (50%) and the witness with sub-clinical anxiety (71.4%). However, for the witness with sub-clinical anxiety and depression, having more confidence in what she was saying was the most commonly stated means of improving credibility (47.1%). Similar findings were revealed when mock jurors were informed of the witness's mental health status. Providing more detail remained the most commonly mentioned suggestion for improving credibility for both the typical witness (61.5%) and the witness with sub-clinical anxiety (42.9%). For the witness with sub-clinical anxiety and depression, having more confidence in what she was saying was the most common suggestion (43.8%). In terms of the cross-examination, when mock jurors were uninformed of the witness's mental health status, having more confidence in what she was saying remained the most commonly mentioned suggestion for improving credibility for all three witnesses (typical: 57.1%; sub-clinical anxiety and depression: 60%; sub-clinical anxiety: 44.4%). The same suggestion remained the most common for all three witnesses when mock jurors were informed of their mental health status (typical: 88.9%; sub-clinical anxiety and depression: 45.5%; sub-clinical anxiety: 75%). Regarding the witness's overall credibility (across both interview and cross-examination), when mock jurors were uninformed of the witness's mental health status, being more consistent in their responses between the interview and cross-examination remained the most commonly mentioned suggestion for improving credibility for all three witnesses (typical: 57.1%; sub-clinical

anxiety and depression: 66.7%; sub-clinical anxiety: 62.5%). This also remained the most common suggestion for all three witnesses when mock jurors were informed of their mental health status (typical: 71.4%; sub-clinical anxiety and depression: 57.1%; sub-clinical anxiety: 77.8%).

Summary. To summarise, the mock jurors perceived the witness with sub-clinical anxiety and depression less favourably at interview than the other two witnesses, irrespective of whether they were informed of the witness's mental health status. At cross-examination, the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, were perceived less favourably when the mock jurors were informed of their mental health problem but only for a limited number of the questionnaire items. In terms of overall credibility, the witness with sub-clinical anxiety and depression was perceived to be less credible than the other two witnesses. In addition, the mock jurors who viewed the witnesses with a mental health problem were more inclined to consider the defendants to be not guilty than those who viewed the typical witness, regardless of whether they knew about their mental health status.

6.4. Discussion

The aim of this study was to compare mock jurors' perceptions of a typical witness with no mental health problems, a witness with sub-clinical anxiety and depression, and a witness with sub-clinical anxiety at interview and cross-examination, and to examine whether being informed of the witness's mental health status influenced their perceptions. There were two independent variables: 1) mental health status of the witness (typical, sub-clinical anxiety and depression, sub-clinical anxiety) and 2) knowledge (informed vs. uninformed of the witness's mental health status). There were ten dependent variables relating to the mock jurors' perceptions (accurate, convincing, confident (in account), confident (in general demeanour), competent, honest, believable, completeness of testimony, cognitive functioning, and capability to testify) and three further dependent variables which measured their perceptions of the witness's credibility at interview, at cross-examination, and overall (across both interview and cross-examination).

With regard to perceptions of the witness at interview, the findings revealed that mock jurors perceived the witness with sub-clinical anxiety and depression to be less accurate, convincing, confident (in both her account and general demeanour), competent, honest,

believable, and credible than the typical witness. They also perceived this witness to have a less complete testimony, worse cognitive functioning, and worse capability to testify. It seems from the qualitative data that confidence (in account) was particularly noticeable to the mock jurors as this was the most commonly stated means of improving credibility for the witness with sub-clinical anxiety and depression. This is consistent with previous research that suggests that confidence influences jurors' perceptions of credibility (Dodson & Dobolyi, 2015). Although there is a lack of literature on the effects of mental health on eyewitness memory, there is a wealth of research on public stigma attached to mental health (e.g., Corker et al., 2016; Mental Health Foundation, 2019c) and based on this research it was initially hypothesised that mock jurors would have biased perceptions of witnesses with a mental health problem. However, the findings described above were irrespective of whether the mock jurors were informed of the witness's mental health status and therefore do not support this hypothesis. It appears that even in the absence of knowledge of whether the witness did or did not have anxiety and depression, perceptions amongst mock jurors were still affected. This is consistent with a previous mock juror study that explored perceived credibility of children with ID (Henry et al., 2011). However, it is inconsistent with other research that has revealed that the presence of knowledge can influence perceptions. Stobbs and Kebbell (2003), for example, found that mock jurors who were informed of a witness's learning disability were reluctant to rely on their evidence. Furthermore, a study that used transcripts that indicated the age of the witness revealed that adult witnesses were perceived with more integrity than child witnesses (Bruer & Pozzulo, 2012). The present findings are also inconsistent with research to suggest that stereotypical views can influence jurors' beliefs and judgements about witness credibility regardless of the quality of their evidence (Peled et al., 2004). Given such research and the public stigma surrounding mental health (Corker et al., 2016; Mental Health Foundation, 2019c), the present findings are surprising. In addition, the witness with sub-clinical anxiety and depression was perceived to be less accurate, convincing, confident (in her account), competent, believable, and credible at interview than the witness with sub-clinical anxiety as well as have a less complete testimony and worse cognitive functioning. As the witness with sub-clinical anxiety and depression was clearly perceived differently to the other two witnesses but there was no effect of knowledge found, it is possible that there may be factors about the testimony provided by this witness that make it less credible. When subsequently analysing the video material, she was found to have made very little eye contact with the interviewer and demonstrated non-verbal behaviour during the interview

(e.g., continually touching her ear) which may have influenced the mock jurors' perceptions. Indeed, there is research to suggest that eye contact influences jurors' perceptions of credibility (Field et al., 2010). Therefore, there may have been a potential impact of behavioural manifestations of anxiety and depression, i.e., it may have been the witness's behavioural manifestations to which the mock jurors were responding rather than knowledge of the witness's mental health status. The modified labelling theory proposes that people are socialised to accept negative social attitudes and beliefs about individuals with a stigmatised mental health status (Link, Cullen, Struening, & Shrout, 1989). When individuals self-label with that same status, social conceptions are internalised and manifested in their behaviour. As a consequence, the mock jurors in the present research may have held negative perceptions of the witness as a response to her behaviour rather than the knowledge (i.e., label) that she had anxiety and depression.

With regard to perceptions of the witness at cross-examination, whilst the findings revealed no main effect of either mental health status or knowledge on mock jurors' perceptions, an interaction effect did emerge. When mock jurors were informed about the witness's mental health status, they perceived the witness with sub-clinical anxiety and depression to be less accurate and have worse cognitive functioning than the typical witness. They also perceived the witness with sub-clinical anxiety to be less honest than the typical witness. It is difficult to compare the present findings to those obtained from previous juror perception studies as past research has focused predominantly on perceptions of the witness at interview. Nevertheless, the findings provide some insight into how different witness groups may be perceived at the cross-examination stage of the legal process. The fact that, when mock jurors were informed about the witness's mental health status, the witnesses with a mental health problem were perceived differently to the typical witness provides evidence for the effect of knowledge on perceptions (Peled et al., 2004) and supports research on mental health related stigma (Corker et al., 2016; Mental Health Foundation, 2019c). Yet, this was only true for a limited number of the dependent variables. For example, when asked how competent the witness was at cross-examination, mock jurors perceived the witnesses with a mental health problem to be just as competent as the typical witness. Consequently, care should be taken when drawing conclusions about perceptions of the witness groups at the cross-examination stage because, for the majority of the questionnaire items, all three witnesses were perceived at an equivalent level.

In relation to credibility, as previously outlined, the witness with sub-clinical anxiety and depression was perceived to be less credible than the other two witnesses at interview. The fact that the mock jurors gave this witness a lower score for all of the additional questionnaire items than the typical witness and a lower score for most of the additional questionnaire items than the witness with sub-clinical anxiety reflects this finding. However, at cross-examination, there was no significant difference in perceptions of credibility between the witness groups. When analysing the cross-examination video material, in contrast to her interview, the witness with sub-clinical anxiety and depression made regular eye contact with the barrister and demonstrated minimal non-verbal behaviour. This suggests that, approximately ten months later, she may have felt more comfortable being asked questions about the crime event or she may have no longer been experiencing anxiety and depression which may explain why she was perceived more positively at cross-examination. On reflection, mental health should have been measured at each time point to establish whether or not the participants still had sub-clinical anxiety and depression, or sub-clinical anxiety, when they were cross-examined. Nevertheless, with regard to overall credibility, taking into account both interview and cross-examination, the witness with sub-clinical anxiety and depression was perceived with less credibility than the typical witness. As there was no significant difference in perceived credibility between these two witnesses at cross-examination, this finding suggests that the interview testimony specifically of the witness with sub-clinical anxiety and depression had a fundamental influence on the mock jurors' perceptions of her overall credibility.

At the end of the questionnaire, mock jurors were asked whether they thought the defendants were guilty or not guilty on the basis of the witness testimony (if all other evidence was equal). The findings revealed that mock jurors who viewed the witnesses with a mental health problem were more inclined to consider the defendants to be not guilty than those who viewed the typical witness, irrespective of whether they knew about the witness's mental health status. It appears that they had less belief in their evidence. This finding is consistent with previous research that suggests that jurors are less likely to decide that a defendant is guilty when they perceive the witness to lack credibility (Pica et al., 2017). However, the fact that the mock jurors who viewed the witness with sub-clinical anxiety were more inclined to consider the defendants to be not guilty is somewhat surprising given that this witness was not perceived significantly differently to the typical witness at interview and only perceived to be less honest at cross-examination. Nevertheless, such findings have implications for the CJS. As studies 2 and 3 revealed (see

Chapters 4 and 5), the testimonies of the witnesses with a mental health problem in the present study were just as accurate as the testimony provided by the typical witness, yet the mock jurors had less belief in their evidence and were consequently more inclined to consider the defendants to be not guilty even though their evidence was just as accurate and reliable as that of the typical witness. This indicates that jurors may be using other factors in place of the witness's actual testimony to reach their decision which could lead to an unfair trial.

The present study has several limitations. First, the method used differed from an actual court case and therefore care should be taken when extrapolating the findings. Whilst the use of video clips is closer to real-world procedure than the use of transcripts, this study would have been more ecologically valid if the participants had been questioned within a real court setting. Had they seen the witness physically being questioned within the context of a real court, the findings may have been different. The participants who were informed of the witness's mental health problem may, for example, have had more empathy and taken their mental health problem into account when forming their perceptions. Second, the participants took part in the study on their own and formed their verdict individually. Their responses to the questionnaire and indeed their verdict may have been different if they had participated in deliberations with other jurors, as in real life. Third, the participants watched the witness describing a specific case (i.e., a distraction burglary) and consequently the findings cannot be generalised to different cases. Fourth, the participants were only provided with the free recall part of the witness's investigative interview. As a result, they may have responded differently had they also been given access to the witness's responses to the follow-up questions as this may have provided them with more information about her credibility at interview. In addition, the design of the questionnaire used to measure the participants' perceptions could be improved. The questionnaire did not, for example, ask the participants to state whether they had previously been on jury service. If any of the participants had been on a real jury, their perceptions may have been influenced by their experiences. Furthermore, the witnesses with a mental health problem did not have a formal mental health diagnosis and therefore it is important to recognise that the present findings may not apply to perceptions of witnesses who have a formal diagnosis. The findings may have differed if the witnesses had more severe anxiety and depression, and anxiety. On the other hand, the participants in this study were not informed of the lack of a formal diagnosis and consequently it could be argued that they may have formed their perceptions on the assumption that the witnesses had been

diagnosed with anxiety and depression, or anxiety. In addition, asking the mock jurors to view just one witness from each mental health group is problematic as there may have been a unique characteristic of that witness that may have influenced the findings (Wells & Windschitl, 1999). Therefore, it would have been more methodologically robust to ask the mock jurors to view more than one witness from each group to enable us to make generalisations about anxious or depressed witnesses as a group, rather than the performance of one single example of each.

To conclude, the mock jurors perceived the witness with sub-clinical anxiety and depression less favourably than the typical witness at interview regardless of whether they were informed of her mental health problem. Such findings are inconsistent with the literature on the effects of knowledge on perceptions and research on mental health related stigma; however, care should be taken when comparing between the present study and previous research on mental health related stigma as previous studies have explored other factors such as behaviours rather than merely knowledge which was the focus of the present study. The witness with sub-clinical anxiety and depression was also perceived less favourably at cross-examination; however, only for a limited number of the questionnaire items. When the mock jurors were asked to give their verdict, those who viewed the witnesses with a mental health problem were more inclined to consider the defendants to be not guilty than those who viewed the typical witness, irrespective of whether they were informed of their mental health status. This has implications for the CJS given that there was no difference in the quality of the witness testimonies between groups.

Chapter 7

Final Discussion

7.1. Summary of Findings

The present thesis described four new studies. The first study, described in Chapter 2, obtained legal professionals' perceptions of witnesses with anxiety and depression. This study ascertained that legal professionals working at various stages of the criminal justice process (police officers, barristers, judges, solicitor-advocates, and registered intermediaries) frequently encounter witnesses with anxiety and depression. It was revealed that, on the whole, such witnesses are perceived to be credible which is inconsistent with previous research within the field (e.g., Watson et al., 2004). However, a large proportion reported that pre-existing knowledge of anxiety and depression derived mainly from professional experience rather than robust evidence-based sources influenced their perceptions, particularly regarding witness reliability. They also believed that pre-existing knowledge may influence jurors' perceptions; however, this was not revealed in the fourth study of this thesis which will be discussed later. Regarding interview procedures, there was a strong feeling amongst those involved with the interviewing process (police officers, solicitor advocates, and registered intermediaries) that changes are needed to the investigative interviewing procedures involving witnesses with anxiety and depression, specifically better mental health awareness training for professionals, more time allocated to conduct interviews, and more rapport building. Furthermore, the findings revealed that the current support for such witnesses is not satisfactory even though the ABE guidance (Ministry of Justice, 2011) including special measures was supported by most groups, particularly police officers.

The findings of the first study of this thesis demonstrated the importance of, and need for, further research on mental health and eyewitness performance. Consequently, the second study, described in Chapter 4, examined the eyewitness performance (memory recall and identification accuracy) of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, compared to that of typical witnesses (with no mental health problems). Within this study, participants' levels of anxiety and depression were classified and their general memory functioning and degree of suggestibility were measured. The findings are reported in Chapter 3. The results of the psychometric measures revealed that the groups

with sub-clinical anxiety and depression, and sub-clinical anxiety, obtained higher scores of anxiety than the typical group, and the group with sub-clinical anxiety and depression obtained higher scores of depression than the other two groups. However, a depression only group did not emerge. With regard to general memory functioning and degree of suggestibility, there were no differences between the groups. A mock witness paradigm was used to investigate witness performance during 1) a statement taking interview, 2) a full investigative interview, and 3) PP and PA video identification lineups. No differences in memory recall or identification accuracy emerged between the groups. One week after witnessing the event, the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, were just as capable at remembering details about the crime event during an ABE compatible interview and just as capable at 1) making a correct identification on a PP identification lineup and 2) making a correct rejection on a PA identification lineup compared to the typical witnesses. Such findings are inconsistent with the literature on general memory that suggests that memory capabilities are impaired by depression (e.g., Austin et al., 2001; Gallassi et al., 2001) and anxiety (e.g., Pacheco-Unguetti et al., 2011; Plana et al., 2014), and also with research indicating that trait anxiety is associated with poor memory retrieval in an eyewitness context (e.g., Dobson & Markham, 1992). Similarly, the findings do not support previous literature that has explored the identification performance of other vulnerable groups and found that their identification accuracy is worse than that of their typical counterparts (e.g., Erickson et al., 2016; Henry & Wilcock, 2013; Wilcock & Bull, 2010).

In addition to examining the eyewitness performance of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, at the interview stage of the legal process, it was also important to examine their performance at a later stage, i.e., at cross-examination, as this has not been investigated before. The third study, described in Chapter 5, investigated the cross-examination performance and the effects of suggestibility on a sample of the mock witnesses from the second study. This study is the first to examine the cross-examination performance of witnesses with a mental health problem and the method used is a novel approach to cross-examination research. There was a ten-month delay (approximately) between the investigative interview in the second study and the cross-examination which is representative of the average delay in real proceedings (Rossetti, 2015). The findings revealed that the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, performed at an equivalent level to the typical witnesses under the pressure of cross-examination style questioning. Approximately ten months after

witnessing the crime, their memory trace of the event was just as strong and they were just as resistant to the barrister's suggestions that they were wrong about their original evidence as the typical witnesses. Such findings contradict previous literature that has demonstrated that delayed memory recall is impaired in individuals with sub-clinical depression (e.g., Ramponi et al., 2010) and anxiety (e.g., Butters et al., 2011; Crespo et al., 2015), and also a wealth of research on the detrimental effects of misleading post-event information on the memory recall of vulnerable groups such as children and adults with an ID (e.g., Gudjonsson & Henry, 2003; Kebbell et al., 2004; Ridley et al., 2002).

As well as assessing legal professionals' perceptions in the first study of this thesis, another much needed area of research is jurors' perceptions. The fourth study of this thesis, described in Chapter 6, explored mock jurors' perceptions of the interview and cross-examination performance of a typical mock witness compared to that of a mock witness with sub-clinical anxiety and depression, and a mock witness with sub-clinical anxiety. The interviews and cross-examinations were shown on video and taken from the second and third studies of this thesis. Contrary to previous research (e.g., Peled et al., 2004; Stobbs & Kebbell, 2003), there was no effect of knowledge of mental health status of the witness on mock jurors' perceptions. This is also inconsistent with what the literature suggests about mental health related stigma (e.g., Corker et al., 2016; Mental Health Foundation, 2019c) and the beliefs of legal professionals in the first study of this thesis that prior knowledge of a witness's mental health problem would influence how jurors perceive their evidence. The findings revealed that, irrespective of whether they were given information about the witness's mental health status, mock jurors perceived the witness with sub-clinical anxiety and depression to be less credible overall than the typical witness. This finding may have been due to the witness making very little eye contact with the interviewer and demonstrating non-verbal behaviour during the interview (e.g., continually touching her ear). It was also found that, again irrespective of whether they received knowledge about the witness's mental health status, mock jurors were more inclined to consider the defendants to be not guilty after viewing the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, even though their evidence was just as accurate and reliable as that of the typical witness. In this situation, jurors may be using other factors instead of the witness's actual testimony to reach their decision which could result in an unfair trial. Whilst it has been shown that knowledge does not qualify as one of these factors, other factors such as body language, tone of voice, and general demeanour may be playing a role. The present chapter will integrate the findings reported in the previous

chapters, focusing on the theoretical and practical implications of the findings before addressing the methodological limitations of the studies and possible directions for future research.

7.2. Theoretical and Practical Implications

7.2.1. Theoretical Implications

The research presented in this thesis has revealed that the eyewitness performance (memory recall and identification accuracy) of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, is no worse than that of their typical counterparts. Such findings have theoretical implications. The existing research and theory on the effects of anxiety and depression have not been supported by the findings of this thesis as an effect of mental health on memory performance did not emerge. The majority of the existing literature on mental health and general cognitive functioning has demonstrated that anxiety (e.g., Buodo et al., 2011; Pacheco-Unguetti et al., 2011) and depression (e.g., Gallassi, Morreale, & Pagni, 2001; McDermott & Ebmeier, 2009) can significantly impair memory performance. With regard to episodic memory, which is critical for eyewitness memory, the present findings do not support the specific deficit of recollection that has been demonstrated in depression (e.g., Drakeford et al., 2010; Ramponi et al., 2010) and are also inconsistent with one of the primary memory biases associated with depression known as overgeneral autobiographical memory (OGM) (e.g., Dillon & Pizzagalli, 2018). With regard to eyewitness performance specifically, the present findings support the theory that trait anxiety has no adverse effect on eyewitness memory recall (Ridley, 2003) and identification accuracy (Valentine & Mesout, 2008) but is inconsistent with research suggesting that individuals with high trait anxiety are unable to provide as many correct responses as those with low trait anxiety when asked to identify details of an event (Dobson & Markham, 1992). Regarding depression, the literature is very limited and therefore it is difficult to compare the present findings. As this thesis does not build on existing research and theory on the effects of anxiety and depression on memory performance, it could be the case that sub-clinical anxiety and depression, and sub-clinical anxiety, do not have a significant effect on eyewitness memory. Furthermore, the lack of support for the memory deficits associated with anxiety and depression may be explained by the findings in Chapter 3 of this thesis. The lack of group differences in general memory performance in Chapter 3 follows through to the lack of group differences in eyewitness

performance in Chapters 4 and 5. When participants were measured for general memory functioning, including memory for stories (recall) and facial memory (recognition), there were no significant differences between those with a sub-clinical mental health problem and those with no mental health problems. This could be due to the participants not being sufficiently anxious and depressed for an effect of mental health on memory to have emerged. Indeed, the majority of the literature that has demonstrated an effect of mental health on general memory functioning has involved individuals with a clinical mental health disorder whereas the sample in this thesis did not have a formal mental health diagnosis which may explain the disparity in findings. Consequently, it may be that clinical levels of anxiety and depression, and anxiety, do affect eyewitness memory and this needs to be examined further.

From a theoretical perspective, this thesis makes a significant contribution to the field of eyewitness performance and mental health as it proposes that adults with a sub-clinical mental health problem may not be poorer eyewitnesses than typical adults. This is an important finding given that many mental health problems are undiagnosed and untreated in the UK. Research has found that 36% of common mental health problems such as anxiety and depression are undiagnosed (Open Access Government, 2019). It is important, however, to keep in mind that the studies presented in this thesis are amongst only a small number to have investigated the eyewitness performance of individuals with a mental health problem and consequently further research is very much needed before firm conclusions can be drawn about the capabilities of such witnesses.

With regard to the cross-examination findings in Chapter 5, again these may be explained by the results of the GSS-2 in Chapter 3 which revealed no significant group differences in suggestibility. The lack of group differences in levels of suggestibility in Chapter 3 follows through to Chapter 5 as the witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, were no more suggestible than their typical counterparts when exposed to misleading information at cross-examination. It is difficult to compare these findings to previous literature as the study in Chapter 5 is the first to examine the cross-examination performance of witnesses with a mental health problem. Given that the existing literature on mental health and general memory capabilities has revealed memory problems associated with anxiety and depression (e.g., Gallassi et al., 2001; Plana et al., 2014), and delayed memory is affected to a greater degree in individuals with a sub-clinical mental health problem (e.g., Ramponi et al., 2010), it seems surprising that their recall

performance under the pressure of cross-examination style questioning was equivalent to that of their typical counterparts. On the other hand, their GSS-2 scores in Chapter 3 were not significantly different to those obtained by the typical group and therefore it is perhaps unsurprising that as a result they were no more suggestible in the subsequent cross-examination study. Whilst this thesis does not build on the existing cross-examination research involving vulnerable groups such as adults with learning disabilities (e.g., Kebbell et al., 2001) and children (e.g., Zajac et al., 2003), which has revealed that vulnerability impairs recall at cross-examination, it does contribute significantly to the field as it is the first study to examine the cross-examination capabilities of witnesses with a mental health problem.

Regarding Chapter 2 of this thesis, there are very few studies within the literature that have explored legal professionals' perceptions of mental health, as discussed in Chapter 1. On the one hand, the present findings are inconsistent with the idea that legal professionals perceive witnesses with a mental health problem to lack credibility (e.g., Watson et al., 2004) as, overall, the legal professionals perceived witnesses with anxiety and depression to be credible. But, on the other hand, the present findings build on existing literature that has proposed that legal professionals are not equipped with adequate knowledge about mental health (e.g., Reavey et al., 2016). Furthermore, the legal professionals' beliefs that prior knowledge of mental health influences jurors' perceptions of witness evidence is consistent with previous literature that has demonstrated that knowledge of a witness's vulnerability can affect jurors' perceptions of the credibility of their evidence (e.g., Bruer & Pozzulo, 2012; Peled et al., 2004; Stobbs & Kebbell, 2003). However, this finding does not correspond to the findings of the mock juror perception study in Chapter 6 of this thesis which revealed that there was no effect of knowledge of the mental health status of the witness on overall witness credibility. The witness with sub-clinical anxiety and depression was perceived as less credible than the typical witness irrespective of whether the mock jurors received information about her mental health status which is inconsistent with previous literature (e.g., Bruer & Pozzulo, 2012; Peled et al., 2004; Stobbs & Kebbell, 2003). In addition, there is a wealth of literature on public stigma associated with mental health (e.g., Corker et al., 2016; Mental Health Foundation, 2019c), yet the present thesis does not support such literature as the provision of knowledge regarding the mental health status of the witness did not influence perceptions and therefore stigmatisation did not play a role. Nevertheless, an effect of mental health on its own (regardless of knowledge) was revealed and this extends previous research within the area of vulnerability that has demonstrated

that even in the absence of knowledge of whether a child does or does not have an ID, mock jurors' perceptions of credibility are still affected (Henry et al., 2011). The present findings are also consistent with previous research suggesting that jurors are less likely to decide that a defendant is guilty when they perceive the witness to lack credibility (Pica et al., 2017).

It is important to consider the fact that theories on the effects of anxiety and depression have focused largely on participants with more severe or diagnosed cases of anxiety and depression, and it may therefore be helpful for researchers to acknowledge the growth in sub-clinical cases and investigate in a consistent manner the effect of sub-clinical anxiety and depression on a range of cognitive tests.

7.2.2. Practical Implications

The findings of this thesis also have implications for practice and the CJS as they demonstrate that witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, may be capable of providing evidence that is of the same quality as that provided by a typical witness, not only at interview but also when questioned in a suggestible manner later in the investigative process. As this thesis presents the first study to examine the capabilities of witnesses with a combination of sub-clinical anxiety and depression at interview as well as the first study to explore the cross-examination performance of witnesses with a mental health problem, there is currently very little evidence upon which legal professionals working within the CJS can draw when supporting such witnesses.

As outlined in Chapter 1, anxiety and depression are two of the most prevalent mental health problems within the community (Mental Health Foundation, 2019b) and this was accentuated in Chapter 2 when professionals working at all stages of the criminal justice process stated that they frequently encounter witnesses with anxiety and depression. Consequently, it is vital that professionals are informed of their eyewitness capabilities. As Chapter 2 revealed, a large proportion of legal professionals believe that prior knowledge of anxiety and depression influences their perceptions with many stating that it causes them to question the reliability of witness evidence. When asked about the capabilities of witnesses with anxiety and depression, the most common response across all legal groups was that capabilities were *moderately* or *slightly* reduced with a similar response given for accuracy. This has significant implications for the CJS as such witnesses may be perceived

differently to typical witnesses even though they may be just as capable and accurate. The fact that professionals may have biased views of such witnesses could give rise to good quality evidence being deemed inadmissible which could ultimately lead to an unfair trial or even cases failing to get to trial. However, the legal professionals in Chapter 2 were asked about witnesses with a mental health 'disorder' rather than a sub-clinical mental health problem which may have affected their responses and therefore caution should be taken when extrapolating between the findings of Chapter 2 and Chapters 4, 5, and 6 which involved sub-clinical samples performing in a laboratory task. Nevertheless, the findings of Chapter 2 revealed that more than 80% of legal professionals may suspect that a witness has a mental health problem even if they have not been informed of a formal diagnosis which raises the question of whether such witnesses are treated fairly during the investigative process. Legal professionals need to be equipped with informed knowledge that a witness who has got anxiety and depression, or anxiety, but not a formal diagnosis, may be just as capable and accurate as a typical witness. Less than 55% of legal professionals across all groups in Chapter 2 were aware of mental health awareness training in their profession. It seems therefore that there is a need for further training to provide professionals with the knowledge and understanding of the eyewitness capabilities of such witnesses in order to reduce as much as possible prejudiced beliefs identified by previous research (e.g., Reavey et al., 2016). It is perhaps to be expected that legal professionals are not yet equipped with the appropriate knowledge given that there is no published research on the psychological functioning in witnesses with a combination of anxiety and depression, or anxiety on its own, during the investigative process. Further training will help to ensure that these witnesses are provided with the same opportunity as typical witnesses to give their best evidence.

Furthermore, whilst this thesis has demonstrated that prior knowledge of a witness's mental health problem influences legal professionals' perceptions, in general, this was not found to be true for mock jurors' perceptions (see Chapter 6). In real-life, jurors may or may not be aware that a witness has a mental health problem when asked to evaluate their evidence, particularly if the witness does not have a formal diagnosis as per the mock witnesses in this thesis. Yet, the findings in Chapter 6 suggest that this may not necessarily be an issue as the knowledge of a witness having anxiety and depression, or anxiety, did not affect how the credibility of their evidence was perceived. Similarly, it appears that jurors' decisions with regard to whether they believe the defendant(s) to be guilty or not guilty are also unaffected by such knowledge. Additionally, as the witness with sub-clinical

anxiety and depression was perceived by mock jurors to be less credible than the typical witness, despite her evidence being just as accurate and reliable, one may argue that those working within the legal system need to be aware of the factors that may influence jurors' perceptions of credibility (and ultimately their decision making) in order to ensure a fair trial. The non-verbal behaviour that the witness in this thesis displayed when giving evidence may have affected the mock jurors' perceptions and consequently such behaviour may have been used instead of her actual testimony to form their decisions. This has implications for real-life cases as it means that witnesses who may not present themselves in a convincing manner may be disregarded when in fact their evidence may be crucial to the case. For example, previous research has demonstrated that witness confidence has a strong influence on mock jurors' judgements, regardless of the consistency of the testimony (e.g., Brewer & Burke, 2002).

7.3. Limitations and Future Research

This thesis provides a preliminary investigation into the eyewitness performance of witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety, and an insight into how mental health is perceived at different stages of the legal process. However, there are several limitations associated with the research. One such limitation relates to ecological validity. Regarding Chapter 4, the participants were mock witnesses and did not see a real crime. As such, they were not interviewed in an official interview room by a police officer and therefore the apprehension associated with a real-life interview could not be replicated. Similarly, regarding Chapter 5, the mock witnesses were not cross-examined within the context of a real court which is likely to be more stressful. Nonetheless, efforts were made to make the cross-examinations as ecologically valid as possible by using practising barristers to question the witnesses, even though they would have appeared less intimidating than barristers in a real-life case as they were not in court dress. Furthermore, the crime event in Chapter 4 was shown to the mock witnesses on video. Watching a video event is different to witnessing a live event as it does not entail the degree of threat and alarm that a witness may experience during a real crime (Penrod, Fulero, & Cutler, 1995). The findings of eyewitness studies that have investigated the effects of stress on the encoding stage of memory are mixed with some suggesting that stress negatively affects eyewitness memory (e.g., Deffenbacher et al., 2004) and others suggesting that it enhances memory for emotional information (e.g., Payne et al., 2007). Yet, the crime event shown in this thesis was mild and consequently the findings in Chapter

4 may have been different if the mock witnesses had watched a more traumatic event. This limitation extends to the mock juror perception study in Chapter 6. The mock jurors were aware that the witness had observed a mild mock crime event which may have influenced their perceptions of witness credibility. Nevertheless, whilst this may have affected the ecological validity of the findings, it would not have been ethically appropriate to expose the mock witnesses to a traumatic event.

A further limitation of this thesis is a lack of generalisability. As the mock witnesses in Chapters 4 and 5 did not have a mental health disorder as defined by the Mental Health Act (1983, as amended by the Mental Health Act, 2007), the findings of this thesis may not be generalisable to witnesses deemed 'vulnerable' by the CJS (Ministry of Justice, 2011). Consequently, caution must be taken before 1) concluding that eyewitnesses with a combination of anxiety and depression, or anxiety on its own, are just as capable as typical witnesses and 2) basing suggestions for education of practitioners in the CJS and jurors on these findings. The participants in Chapters 4 and 5 were sub-clinical samples performing in a laboratory task and therefore would not have shown the same levels of anxiety as those witnesses typically interviewed and seen at court who will 1) have experienced an incident with higher levels of trauma and 2) be giving evidence in the intimidating surroundings of a court room. Given that there is previous research to suggest that the general memory capabilities of adults with severe anxiety (e.g., Plana et al., 2014) and severe depression (e.g., Drakeford et al., 2010) are significantly impaired, it may be that their eyewitness memory is also diminished. Had the studies in Chapters 4 and 5 included participants with a diagnosed mental health disorder, different findings may have emerged and therefore research addressing the eyewitness capabilities of adults with a formal mental health diagnosis is essential. Nevertheless, the focus of this thesis was sub-clinical mental health due to the growing number of adults with undiagnosed mental health problems in the UK (Open Access Government, 2019). Also, mental health has become a topic of increasing focus in higher education in recent years (Office for National Statistics, 2018). Research has shown that the university student population commonly experience mental health related difficulties (e.g., Education Policy Institute, 2018) and it was therefore deemed appropriate to target this population in the present research.

Furthermore, this thesis did not examine the capabilities of adult witnesses with depression on its own. This is because a depression only group did not emerge from the results of the psychometric measures in Chapter 3 which, on reflection, is perhaps unsurprising given

that depression is less prevalent within the general population than anxiety (Stansfeld et al., 2016). Whilst the findings of this thesis have shed light on how witnesses with sub-clinical anxiety and depression perform at interview and cross-examination, such findings cannot be generalised to adults with sub-clinical depression as their eyewitness capabilities may be different in the absence of anxiety. Also, the samples in Chapters 4 and 5 comprised largely female students studying at the University of Winchester which limits the generalisability of the findings to males and adults from different age groups and backgrounds. Nevertheless, the sample in this thesis was fairly representative as females are three times more likely than males to experience common mental health problems, such as anxiety and depression, and young females are more likely to experience anxiety related problems than any other group (Mental Health Foundation, 2019a).

Additionally, care should be taken when extrapolating the findings in Chapter 2 as, previously stated, the legal professionals were asked to respond to questions about their perceptions and experiences of witnesses with a mental health 'disorder'. The reason why this term was used in the questionnaire was because the severity of the mental health problems experienced by the mock witnesses in Chapters 4 and 5 was unknown at the point at which the questionnaire was administered to the legal professionals. Their responses may have been different had they been asked to provide information about witnesses with a sub-clinical mental health problem instead. However, one may argue that non-experts may not necessarily understand or appreciate the differences between the terms 'sub-clinical mental health problem' and 'clinical disorder'. Moreover, the generalisability of the findings in Chapter 6 is limited as the mock jurors each viewed only one witness which means that it is difficult to generalise their perceptions to other witnesses with the same mental health status. Nevertheless, despite its limitations, this thesis does provide initial insight into how adults with a sub-clinical mental health problem may perform within an eyewitness context and therefore it is a starting point from which further research into more severe cases can develop. It has also contributed to our understanding of how such witnesses are perceived at various stages of the legal process.

Based on the implications of the present thesis and its limitations, there are a number of issues to consider for future research. Further research examining the eyewitness performance of adults with a formal mental health diagnosis of anxiety and depression is essential as such individuals are considered 'vulnerable' by the CJS (Ministry of Justice, 2011). This would provide legal professionals with the knowledge and understanding of the

eyewitness capabilities of witnesses with a formal diagnosis of anxiety and depression. This is crucial given that Chapter 2 revealed that legal professionals reported frequently encountering witnesses with these disorders. In addition, most of the literature on mental health and general memory has focused on severe cases but very little eyewitness literature has examined the capabilities associated with formal mental health diagnoses, providing further justification for additional research. It is also important that further investigation is conducted with adults who have depression (without anxiety) as the findings of this thesis only allow for inferences to be made about the eyewitness capabilities of adults with depression in combination with anxiety. It may be that their witness performance is entirely different in the absence of anxiety. Given that, within the literature, there is evidence that the cognitive functioning of depressed individuals is impaired (e.g., Drakeford et al., 2010; McDermott & Ebmeier, 2009; Williams et al., 2007), it is crucial that their capabilities as witnesses are understood. Moreover, further research on the interview and cross-examination performance of adult witnesses from different age cohorts and backgrounds is needed as the participants in this thesis largely comprised female undergraduate students in early adulthood.

Additionally, it would be worthwhile carrying out more ecologically valid studies to build on the findings in Chapters 4 and 5. For example, the use of a real police officer to conduct the interviews in Chapter 4 would be closer to real-life practice even though the researcher in this thesis was trained to conduct an ABE compatible interview. Also, the contexts in which the studies were carried out in both chapters could be improved to approximate the real world by using an actual police interview room and a real or mock court setting to conduct the interviews and cross-examinations. To further improve the ecological validity, mock witnesses could view a live event that depicts a more serious crime than the mild event shown on video in this thesis. However, this may be difficult as it is ethically challenging to put participants through an unnecessary stressful experience. Furthermore, additional mock juror studies with a larger number of examples of witness evidence are necessary to strengthen the findings in Chapter 6. It is essential that mock jurors in future research view more than one mock witness with the same mental health status to provide us with a more thorough understanding of their perceptions and enable us to make generalisations about anxious or depressed witnesses as a group, rather than the performance of one single example of each.

7.4. Conclusion

This thesis has sought to make a significant contribution to the limited literature on 1) the eyewitness performance of witnesses with a sub-clinical mental health problem and 2) the perceptions of such witnesses at different stages of the legal process. The present research is inconsistent with previous research which suggests that anxiety and depression are associated with deficits in general memory but is consistent to some extent with the eyewitness literature, particularly regarding the null effects of trait anxiety on identification accuracy. Whilst literature on the eyewitness capabilities of adults with anxiety and depression is extremely sparse and consequently there are very few studies with which to compare the present findings, this does mean that the present research makes a much-needed contribution to the eyewitness literature regarding mental health. It also extends the limited literature on legal professionals' perceptions of witnesses with anxiety and depression by obtaining information from professionals working at various stages of the legal process and highlighting the influence of prior mental health knowledge on perceptions. Furthermore, the present thesis builds on the existing literature on mock jurors' perceptions by suggesting that witnesses with a mental health problem may be perceived to be less credible than typical witnesses even though their evidence may be just as accurate and reliable, and highlights that mental health knowledge may not necessarily be a determining factor in jurors' decision-making. Given the prevalence of individuals with a mental health problem and therefore the likelihood of them coming into contact with the CJS, it has been vital that eyewitness research within the area of mental health has been conducted.

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Appendices

Appendix A

Online questionnaire (study 1)

THE UNIVERSITY OF WINCHESTER

Psychology Department

Q1

Participant Information Sheet

Exploring legal professionals' perceptions of vulnerable eyewitnesses with anxiety and depression.

To help you decide whether or not to take part in this questionnaire, please read the following information about why the research is being conducted.

What is the purpose of this study?

The purpose of this study is to gain further insight into how legal professionals perceive vulnerable eyewitnesses with a mental health disorder in order to enhance the knowledge and understanding of the perceptions and attitudes held by those working within the legal system, specifically regarding witnesses with anxiety and depression.

Who is eligible to take part in this study?

Both males and females between the ages of 18 and 60 years working in legal professions are being invited to take part.

What will happen to me if I take part?

If you decide to take part, you will be asked to give informed consent. Once you have consented, you will then be required to simply complete the questionnaire, which will take approximately 15 – 20 minutes. Initially, you will be asked to provide some demographic details such as, age and gender. You will then be asked about your legal profession in terms of 1) your role and experience, 2) your contact with mental health witnesses, 3) your perceptions of mental health witness accuracy, 4) support for mental health witnesses, 5) current guidelines and their suitability, and 6) ideas for the future.

Do I have to take part?

It is your decision whether or not to take part. If you do decide to take part, you will be asked to provide your consent. You are still free to withdraw within 14 days and without giving a reason, if you decide to participate.

What are the possible benefits and risks of taking part?

Your participation in this study will simply require you to complete a questionnaire so there are no risks to you if you agree to participate. Whilst there are no direct benefits to you from taking part, it is hoped that the information gained from this study will enable us to further understand the perceptions of legal professionals working within the Criminal Justice System of vulnerable eyewitnesses with anxiety and depression.

Will my participation be kept confidential?

It will be ensured that no names are attached to the data and only the researchers directly involved in the study will have access to the data. Participant details will be coded and no identifiable personal information will be stored.

What should I do if I wish to take part?

If you wish to take part in this study, you will be asked to provide your consent.

What happens if I change my mind?

Your participation in this study is completely voluntary. You may withdraw within 14 days should you wish to do so without any consequences.

What will happen to the results of this research study?

It is hoped that the results of this study will be published in suitable professional journals. It will not be possible to identify any individuals from any of the data presented.

Who has reviewed this study?

This study has been approved by the University of Winchester RKE Ethics Committee. If you have any concerns about the way in which the study has been conducted, you can contact the Chair of RKE Ethics Committee, Dr Maru Mormina: Maru.Mormina@winchester.ac.uk

Contact for Further Information

For further information regarding this study, please contact Beth Parsons: B.Parsons1.15@unimail.winchester.ac.uk

Q2

Consent Form

I have read and understood the information about this study.

I understand that my participation in this study is voluntary and that I may withdraw within 14 days, without penalty.

I understand the arrangements that have been made to ensure my anonymity and privacy, and that my data will remain anonymised.

Any risks which may be involved in my participation in the project have been outlined on the information sheet.

By ticking this box, you are giving your consent to take part in this project.

☐ I agree to take part.

Q3: What is your age? *(please circle)*

18 – 24

25 – 34

35 – 44

45 – 54

55 – 60

Q4: What is your gender? *(please circle)*

Male

Female

Q5: What is your profession? *(please circle)*

Police Officer

Barrister

Judge

Registered Intermediary

Employee of the CPS *(please specify in the box below)*

Q6: If you have selected 'Police Officer', what is your rank? *(please circle)*

Police Constable

Detective Constable

Police Sergeant

Detective Sergeant

Inspector

Detective Inspector

Chief Inspector and above

Detective Chief Inspector and above

Other *(please state in the box below)*

Q7: If you have selected 'Police Officer', within which area of policing do you work? *(please circle)*

Uniform general patrol

General CID

Public Protection

Child Abuse Investigation

Other *(please state in the box below)*

Q8: If you have selected 'Barrister' or 'Judge', which is your principle area(s) of practice? *(please circle)*

Crime

Family

Personal Injury/Clinical Negligence

Employment

Other *(please state in the box below)*

Q9: How many years have you worked within your profession? *(please circle)*

Less than 1 year

1 – 4 years

5 – 8 years

9 – 12 years

13 – 16 years

17 – 20 years

More than 20 years

This questionnaire is concerned with anxiety and depression in vulnerable witnesses. Anxiety is marked by emotional distress, frequent fears, persistent worrying and avoidance behaviour displayed in the absence of any direct threat. There are five major types of anxiety disorders: generalised anxiety disorders, phobic anxiety disorders, panic disorders, obsessive-compulsive disorders, and post-traumatic stress disorder. Depression is a mood disorder that involves a prolonged and fundamental disturbance of mood and emotions, characterised by symptoms such as low mood, loss of energy, lack of concentration, feelings of restlessness, and sometimes suicidal thoughts. Both disorders are included in the Diagnostic and Statistical Manual of Mental Disorders (DSM).

Please answer the following questions based on your own personal experience.

Q10: On average, how often do you come into contact with vulnerable witnesses with anxiety in a typical *month? (please circle)*

Very often

Often

Sometimes

Rarely

Never

Q11: On average, how often do you come into contact with vulnerable witnesses with depression in a typical *month? (please circle)*

Very often

Often

Sometimes

Rarely

Never

Q12: How common is it for a witness to be suffering with anxiety? *(please circle)*

Extremely common

Very common

Moderately common

Slightly common

Not at all common

I don't know

Q13: How common is it for a witness to be suffering with depression? *(please circle)*

Extremely common

Very common

Moderately common

Slightly common

Not at all common

I don't know

Q14: How easy/difficult is it to identify a witness with anxiety? *(please circle)*

Extremely easy

Moderately easy

Slightly easy

Neither easy nor difficult

Slightly difficult

Moderately difficult

Extremely difficult

I don't know

Q15: How easy/difficult is it to identify a witness with depression? *(please circle)*

Extremely easy

Moderately easy

Slightly easy

Neither easy nor difficult

Slightly difficult

Moderately difficult

Extremely difficult

I don't know

Q16: Are there occasions when you suspect that a witness has got a mental health problem, even if you have not been informed of a formal diagnosis? *(please circle)*

Yes

No

Q17: If you have selected 'yes', how often do you suspect that a witness is experiencing a mental health problem? *(please circle)*

Very often

Often

Sometimes

Rarely

Never

Special measures are a range of measures that can be used to facilitate the gathering and giving of evidence by vulnerable and intimidated witnesses including those with mental health issues.

Special measures include:

- **Screens**
- **Live link**
- **Evidence given in private**
- **Removal of wigs and gowns by judges and barristers**
- **Video-recorded interview**
- **Examination of the witness through an intermediary**
- **Aids to communication**

Q18: How appropriate is the 'Achieving Best Evidence' guidance for eliciting evidence from vulnerable witnesses with anxiety and/or depression? *(please circle)*

Extremely appropriate

Moderately appropriate

Slightly appropriate

Neither appropriate nor inappropriate

Slightly inappropriate

Moderately inappropriate

Extremely inappropriate

I don't know

Q19: How effective are *special measures* at supporting vulnerable witnesses with anxiety and/or depression to give their best evidence? *(please circle)*

Extremely effective

Very effective

Moderately effective

Slightly effective

Not effective at all

I don't know

Q20: If you have selected extremely, very, moderately or slightly effective, which aspects are most effective? *(please circle as many or as few as you wish)*

Screens

Live link

Evidence given in private

Removal of wigs and gowns by judges and barristers

Video-recorded interview

Examination of the witness through an intermediary

Aids to communication

Q21: What other types of support are available for witnesses with anxiety and/or depression? *(please provide your answer in the box below)*

Q22: Would you make any changes to how witnesses with anxiety and/or depression are currently supported? *(please circle)*

Yes

No

Q23: If you have selected 'yes', in what ways would you change the current support for these witnesses? *(please provide your answer in the box below)*

Q24: Is there mental health awareness training available within your profession for dealing with witnesses with anxiety and/or depression? *(please circle)*

Yes

No

I don't know

If you have selected 'yes', please continue.
If you have selected 'no' or 'I don't know', please skip to Q30.

Q25: Is this training mandatory? *(please circle)*

Yes

No

I don't know

Q26: Have you completed this training? *(please circle)*

Yes

No

If you have selected 'yes', please continue.
If you have selected 'no', please skip to Q30.

Q27: How effective is this training? *(please circle)*

Extremely effective

Very effective

Moderately effective

Slightly effective

Not effective at all

Q28: How relevant is this training? *(please circle)*

Extremely relevant

Very relevant

Moderately relevant

Slightly relevant

Not relevant at all

Q29: Apart from formal training, do you have any additional knowledge about anxiety and/or depression? *(please circle)*

Yes

No

If you have selected 'yes', please skip to Q31.
If you have selected 'no', please skip to Q33.

Q30: Do you have any knowledge about anxiety and/or depression? *(please circle)*

Yes

No

If you have selected 'yes', please continue.
If you have selected 'no', please skip to Q33.

Q31: From where have you received this knowledge? *(please circle as many or as few as you wish)*

Professional experience

Personal experience with a family member/friend

Media

Work colleague(s)

Literature within the public domain

Other *(please state in the box below)*

Q32: To what extent does this knowledge affect your perceptions of witnesses with anxiety and/or depression? *(please circle)*

A great deal

A lot

A moderate amount

A little

Not at all

Q33: How capable are witnesses with <u>anxiety</u> of providing witness evidence when no additional support is available? *(please circle)*

Entirely capable

Moderately capable

Slightly capable

Not capable at all

I don't know

Q34: How capable are witnesses with depression of providing witness evidence when no additional support is available? *(please circle)*

Entirely capable

Moderately capable

Slightly capable

Not capable at all

I don't know

Q35: How accurate is evidence provided by witnesses with anxiety? *(please circle)*

Entirely accurate

Moderately accurate

Slightly accurate

Not accurate at all

I don't know

Q36: How accurate is evidence provided by witnesses with depression? *(please circle)*

Entirely accurate

Moderately accurate

Slightly accurate

Not accurate at all

I don't know

If you are a barrister or a judge, please skip to Q44.

If you are a police officer, registered intermediary, or an employee of the CPS, please continue.

Q37: What are the standard procedures for interviewing witnesses with anxiety and/or depression? *(please circle)*

The same as for typical witnesses (with no mental health problems)

Different from typical witnesses (with no mental health problems)

I don't know/I'm not sure

If you have selected 'Different from typical witnesses', please continue.
If you have selected 'The same as for typical witnesses', please skip to Q39.
If you have selected 'I don't know/I'm not sure', please skip to Q40.

Q38: How do the interview procedures differ from those used with typical witnesses? *(please provide your answer in the box below)*

Q39: How effective are these interview procedures at obtaining useful information from witnesses with anxiety and/or depression? *(please circle)*

Extremely effective

Very effective

Moderately effective

Slightly effective

Not effective at all

I don't know

Q40: Would you make any changes to how witnesses with anxiety and/or depression are currently interviewed? *(please circle)*

Yes

No

If you have selected 'yes', please continue.
If you have selected 'no', please skip to Q42.

Q41: How would you change the ways in which these witnesses are interviewed? *(please provide your answer in the box below)*

Q42: How easy/difficult is it dealing with witnesses with anxiety? *(please circle)*

Extremely easy

Moderately easy

Slightly easy

Neither easy nor difficult

Slightly difficult

Moderately difficult

Extremely difficult

I don't know

Q43: How easy/difficult is it dealing with witnesses with depression? *(please circle)*

Extremely easy

Moderately easy

Slightly easy

Neither easy nor difficult

Slightly difficult

Moderately difficult

Extremely difficult

I don't know

Q44: With no additional support, how able are witnesses with anxiety to give evidence in court? *(please circle)*

Entirely able

Moderately able

Slightly able

Not able at all

I don't know

Q45: With no additional support, how able are witnesses with depression to give evidence in court? *(please circle)*

Entirely able

Moderately able

Slightly able

Not able at all

I don't know

Q46: How is it decided that a witness with anxiety and/or depression is sufficiently competent to give evidence? *(please provide your answer in the box below)*

Q47: How credible are witnesses with anxiety? *(please circle)*

Entirely credible

Moderately credible

Slightly credible

Not credible at all

I don't know

Q48: How credible are witnesses with depression? *(please circle)*

Entirely credible

Moderately credible

Slightly credible

Not credible at all

I don't know

Q49: Do you feel that prior knowledge of a witness's mental health problem (anxiety and/or depression) influences how you perceive their evidence? *(please circle)*

Yes

No

I don't know

If you have selected 'yes', please continue.
If you have selected 'no' or 'I don't know', please skip to Q51.

Q50: How does prior knowledge influence your perceptions of their evidence? *(please provide your answer in the box below)*

Q51: If there is no other evidence, how often do cases involving a witness with anxiety and/or depression make it to court? *(please circle)*

Very often

Often

Sometimes

Rarely

Never

I don’t know

Q52: To what extent do you think jurors find witnesses with anxiety and/or depression to be credible witnesses? *(please circle)*

Entirely credible

Moderately credible

Slightly credible

Not credible at all

I don’t know

Q53: To what extent do you feel that prior knowledge of a witness's mental health problem (anxiety and/or depression) could influence jurors' decision making? *(please circle)*

A great deal

A lot

A moderate amount

A little

Not at all

I don’t know

Q54: Is there anything that you feel could be changed in the future in order to improve the legal process involving witnesses with anxiety and/or depression? *(please circle)*

Yes

No

If you have selected 'yes', please continue.
If you have selected 'no', please skip to Q56.

Q55: Which of the following aspects could be changed? *(please circle as many or as few as you wish)*

General training about mental health

Specific training relating to individual mental health conditions

Multidisciplinary training with partner agencies

Special measures

General support for vulnerable witnesses

Other *(please state in the box below)*

Q56: Please circle the option in each demographic group that is most likely to represent witnesses with anxiety.

Gender

Male

Female

I don’t think that anxiety is more likely in either gender

Q57: Age

18 – 24

25 – 34

35 – 44

45 – 54

55 – 64

65 or older

I don’t think that anxiety is more likely in any particular age group

Q58: Ethnicity

White

Black or African American

American Indian or Alaska Native

Asian

Native Hawaiian or Pacific Islander

Other

I don’t think that anxiety is more likely in any particular ethnic group

Q59: Socioeconomic status

High

Middle

Low

I don’t think that anxiety is more likely in any particular socioeconomic group

Q60: Please circle the option in each demographic group that is most likely to represent witnesses with depression.

Gender

Male

Female

I don’t think that depression is more likely in either gender

Q61: Age

18 – 24

25 – 34

35 – 44

45 – 54

55 – 64

65 or older

I don’t think that depression is more likely in any particular age group

Q62: Ethnicity

White

Black or African American

American Indian or Alaska Native

Asian

Native Hawaiian or Pacific Islander

Other

I don't think that depression is more likely in any particular ethnic group

Q63: Socioeconomic status

High

Middle

Low

I don't think that depression is more likely in any particular socioeconomic group

THE UNIVERSITY OF WINCHESTER

Psychology Department

Q64

Participant Debriefing Sheet

Thank you very much for taking part in this study. The aim of the research was to gain further insight into how legal professionals perceive vulnerable eyewitnesses with a mental health disorder in order to enhance the knowledge and understanding

of the perceptions and attitudes held by those working within the legal system, specifically regarding witnesses with anxiety and depression.

It is hoped that the information gained from this study will enable us to further understand the perceptions of legal professionals working within the Criminal Justice System of vulnerable eyewitnesses with anxiety and depression. We expect to find that legal professionals' perceptions of vulnerable eyewitnesses with mental health disorders will differ from the perceptions held of typical eyewitnesses.

Thank you once again for taking part in this study. If you would like further information about the study, please do not hesitate to contact the researcher, Beth Parsons, at: B.Parsons1.15@unimail.winchester.ac.uk

Appendix B

State-Trait Anxiety Inventory (STAI)

mind garden.com

SELF-EVALUATION QUESTIONNAIRE
STAI Form Y-1

Please provide the following information:

Name_____ Date_____ S_____

Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

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SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name_____ Date_____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

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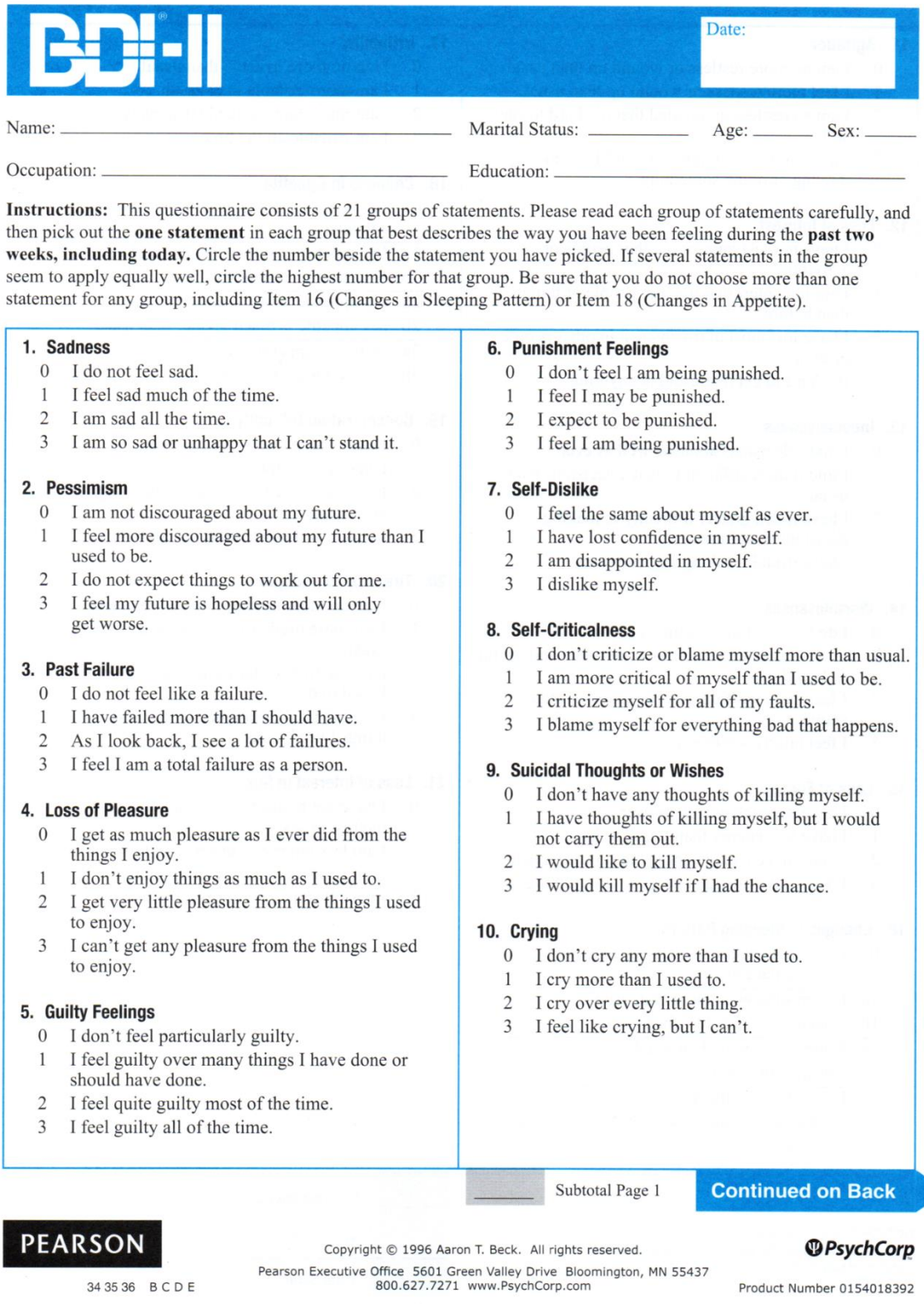
Appendix C

Beck Depression Inventory-2 (BDI-2)



BDI-II

Date:

Name: _____ Marital Status: _____ Age: _____ Sex: _____

Occupation: _____ Education: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today.** Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

2. Pessimism
- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

3. Past Failure
- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4. Loss of Pleasure
- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6. Punishment Feelings
- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7. Self-Dislike
- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

8. Self-Criticalness
- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10. Crying
- 0 I don't cry any more than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

_____ Subtotal Page 1 **Continued on Back**

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34 35 36 B C D E

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11. Agitation

0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it's hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It's hard to get interested in anything.

13. Indecisiveness

0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decisions than I used to.
3 I have trouble making any decisions.

14. Worthlessness

0 I do not feel I am worthless.
1 I don't consider myself as worthwhile and useful as I used to.
2 I feel more worthless as compared to other people.
3 I feel utterly worthless.

15. Loss of Energy

0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don't have enough energy to do very much.
3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

0 I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1–2 hours early and can't get back to sleep.

17. Irritability

0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite

0 I have not experienced any change in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration Difficulty

0 I can concentrate as well as ever.
1 I can't concentrate as well as usual.
2 It's hard to keep my mind on anything for very long.
3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

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_____ Subtotal Page 2

_____ Subtotal Page 1

_____ Total Score

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Appendix D

Structured Clinical Interview for DSM-5 Disorders – Clinical Version (SCID-5-CV)

(Adaptation)

At the beginning:

I am going to ask you some questions about anxiety and depression. I don't want to keep you here for too long so I will be quite direct at times and interrupt you if we need to move onto a new question. Please don't be offended if I do this. It is fine to give me one-word answers.

Initial questions:

1. Have you ever received a diagnosis for a mental health related difficulty and what was it?

2. Are you currently receiving treatment for a mental health related difficulty?

Anxiety

Lifetime Panic Disorder

Have you ever had an intense rush of anxiety, or what someone might call a "panic attack", when you suddenly feel very frightened or anxious or suddenly developed a lot of physical symptoms?

If 'no', go to next section (Agoraphobia)

Tell me about that. What was it like?

During the attack:

- Did your heart race, pound, or skip?
- Did you sweat?
- Did you tremble or shake?

- Did you feel as if you were choking?
- Did you have chest pain or pressure?
- Did you feel dizzy, unsteady, or like you might pass out?
- Did you have tingling or numbness in parts of your body?
- Were you afraid you were going crazy or might lose control?

Besides the one you just described, have you had any other attacks?

If 'no', go to next section (Agoraphobia)

Did you do anything differently because of the attacks, like avoiding certain places or not going out alone, or avoiding exercise?

If 'no', go to next section (Agoraphobia)

When did your panic attacks start?

During the past month, how many panic attacks have you had?

Current Agoraphobia (past six months)

Do you have a current diagnosis of agoraphobia?

If 'no', go to next section (Social Anxiety Disorder)

In the past 6 months, have you been very anxious about or afraid of situations, like:

- going out of the house alone
- being in crowds
- being in enclosed spaces (e.g., shops, theatres, cinemas)
- being in open spaces (e.g., big open carparks, marketplaces)
- standing in queues, or
- travelling on buses, trains or other forms of public transport?

Current Social Anxiety Disorder (past six months)

In the past 6 months, have you been especially nervous or anxious in social situations, like having a conversation or meeting unfamiliar people, to a greater degree than other people might experience?

Is there anything that you have been afraid to do or felt very uncomfortable doing in front of other people, like speaking, eating, writing, or using a public toilet?

If 'no', go to next section (Generalized Anxiety Disorder)

Is it something that you have been concerned about?

Tell me about this situation. Give me one brief example of when this has happened.

Have you almost always felt frightened when you would be in this situation?

If 'no', go to next section (Generalized Anxiety Disorder)

Have you gone out of your way to avoid this situation?

If 'no', go to next section (Generalized Anxiety Disorder)

Has your fear or avoidance of this situation been present for most of the past 6 months?

Current Generalized Anxiety Disorder (past six months)

Over the past 6 months, have you been feeling anxious and worried for a lot of the time?

If 'no', go to next section (OCD)

Tell me about this. What kinds of things have you worried about?

- your job
- your health
- your family
- your finances, or
- smaller things, like being late for appointments

Have you worried about this/these thing(s) even when there was no reason?

Have you worried more than most people would in your circumstances?

Has anyone else thought you worried too much?

During the last 6 months, would you say that you have been worrying more days that not?

When you're worrying, have you found that it's hard to stop yourself or to think about anything else?

Now I am going to ask you some questions about symptoms that often go along with being nervous or worried.

Thinking about when you have been feeling nervous, anxious, or worried:

- Have you often felt physically restless or on edge, like you couldn't sit still?
- Have you often tired easily?

- Have you often had trouble concentrating or has your mind often gone blank?
- Have you often been irritable?
- Have your muscles often been tense?
- Have you often had trouble falling or staying asleep?

If 'yes' to 3 or more, continue

If 'yes' to less than 3, go to next section (OCD)

What effect have these symptoms had on your life?

- your relationships or interactions with other people
- your work/education, like your attendance, the quality of your work
- your ability to take care of things in your home
- your ability to do things that are important to you, like physical exercise, hobbies

Have you avoided doing anything because you felt like you weren't up to it?

How much have you been bothered or upset by having these symptoms?

When did these symptoms begin?

Current OCD

In the past month, have you been bothered by thoughts that kept coming back to you even when you didn't want them to, like being exposed to germs or dirt or needing everything to be lined up in a certain way?

If 'no', go to next section (PTSD)

What were they?

In the past month, was there anything that you had to do over and over again and was hard to resist doing, like washing your hands again and again, repeating something over and over again until it "felt right", counting up to a certain number, or checking something many times to make sure that you'd done it right?

If 'no', go to next section (PTSD)

Tell me about this.

What did you have to do?

What would happen if you didn't do it?

How many times would you do it?

Did you do it more than really makes sense?

Current PTSD

Do you have a current diagnosis of Post-Traumatic Stress Disorder?

Depression

Now I am going to ask you some questions about your mood.

Current Major Depressive Episode

In the past month, has there been a period of time when you were feeling depressed or down most of the day, nearly every day? Has anyone said that you look sad, down, or depressed?

If 'no,' ask…

How about feeling sad, empty, or hopeless, most of the day nearly every day?

If 'no', go to next section (Mania)

If 'yes' to either of the above, ask…

What has it been like?

How long has it lasted? As long as 2 weeks?

During that time, did you have less interest or pleasure in things you usually enjoyed? What has that been like?

During that time, how has your appetite been compared to your usual appetite? Have you had to force yourself to eat? Eat less/more than usual? Has that been nearly every day? Have you lost or gained any weight?

How have you been sleeping well?

Have you been so fidgety or restless that you were unable to sit still?

What has your energy been like?

Have you been feeling worthless?

Have you had trouble thinking or concentrating? Has it been hard to make decisions about everyday things?

If 'yes' to most of the above, continue. If 'no' to most of the above, go to next section (Mania)

What effect have these symptoms had on your life?

- your relationships or interactions with other people
- your work/education, like your attendance, the quality of your work
- your ability to take care of things in your home
- your ability to get dressed, bathe, brush your teeth…
- your ability to do things that are important to you, like physical exercise, hobbies

When did this episode of depressive symptoms begin?

Current Mania

Do you have a current diagnosis of mania?

In the past month, has there been a period of time when you were feeling so good, "high", excited, or "on top of the world" that other people thought you were not your normal self?

If 'no', end of questions

If 'yes', ask…

What has it been like? More than just feeling good?

Appendix E

Test of Memory and Learning-2 (TOMAL-2)

Test of Memory and Learning–Second Edition

TOMAL–2
Examiner Record Booklet

Cecil R. Reynolds Judith K. Voress

Name _____

Subtest 1: Memory for Stories

Materials: Examiner Record Booklet

Begin: Ages 5–11: Story 1 Ages 12–19: Story 3 Ages 20–59: Story 4

End: Discontinue testing if the examinee earns a score of 0 for the first story or after two stories have been administered.

Instructions: Say, I'm going to read you a story. Listen carefully, because when the story is done, I want you to tell the story back to me just the way you heard it. I'm going to read the first story now. Read the first story, being sure to begin with the title of the story. At the end of the story, say, Now tell the story back to me the very best you can. Start the second story by saying, Now let's try another one. Remember to tell it back to me just the way you heard it.

Scoring: Award 1 point for each element of the story repeated correctly. See Appendix A for alternative 1-point and 0-point responses.

Record Clock Time: Record the time you finish this subtest in the blank provided following Story 5. Begin the Verbal Delayed Recall subtests (Subtests 15 and 16) in 30 minutes. If you are in the middle of a subtest, finish the subtest and then begin the Verbal Delayed Recall sequence.

Begin Ages 5–11

Story 1—Halloween **Score**

It was almost time / for the Halloween / Carnival / at school, / and Jimmy / could hardly wait. / . . . . . .

It was his favorite / school night. / He saved / his allowance / for a whole month / to buy tickets / . . . . . .

for the cake walk. / On Saturday night, / the night of the Carnival, / he was there when / the doors opened. / . . . . . .

He spent / his whole month's / allowance / on the cake walk. / He won / his three / . . . . . .

favorite things: / a chocolate cake, / a chocolate cake, / and a chocolate cake. / . . . . . .

Maximum: 27 points **Story 1 Raw Score**

Story 2—Bicycle **Score**

John, / who was 8, / saw his best friend, / Sam, / who was also 8, / crash / his red / bike / . . . . . .

as he sped / down / a steep / dirt hill. / Sam / hit the ground / hard / but only skinned his knee / . . . . . .

and cut / his finger. / John / ran over to him / to make sure he was all right. / The bike / . . . . . .

was not as lucky. / The front tire / was flat, / and the handlebars / were bent. / John and Sam / . . . . . .

tried to fix / the once shiny / red / bike / but ended up / pushing it / home. / . . . . . .

Maximum: 35 points **Story 2 Raw Score**

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5 6 7 8 9 10 20 19 18 17 16 15

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Begin Ages 12–19

Story 3—Toy Store Score

Donna, / a fourth grader, / went to Disneyland / with her Mom, / Dad, / and brother, / . . . . . .

Mark. / It was near Christmas time, / and the park / was crowded. / Donna / loved to see / . . . . . .

all the people / rushing around. / Her favorite thing to do / was visit the toy shops / on Main Street. / . . . . . .

Poor Mark / was too short / to see / the toys. / The top / of his head / barely reached / . . . . . .

the countertops, / and it seemed like all he could see / in the busy / crowd / were knees / and legs / . . . . . .

rushing, / rushing everywhere. / . . . . . .

Maximum: 32 points **Story 3 Raw Score**

Begin Ages 20–59

Story 4—Blizzard Score

Marianne / lived on a ranch / in western / Nebraska. / It was only October / and her school, / . . . . . .

Sand Hills Elementary, / had been closed / because a blizzard / was on its way. / Her two older / brothers / . . . . . .

were out on the tractor / with Dad / leaving extra hay / for the cows. / She wanted to go, too, / . . . . . .

but Mom said she was too little. / Didn't they know being a sixth grader / was almost grown-up? / . . . . . .

Marianne had her duties too, though. / She was in the barn / with a big / pitchfork / spreading / hay / . . . . . .

for the horses. / It could be days / before school opened again. / Blizzards / could last a week. / . . . . . .

Maximum: 31 points **Story 4 Raw Score**

Story 5—The Algebra Story Score

Christopher / just hated / algebra class. / Mr. Wylie / always gave too much homework. / . . . . . .

He also went too fast. / Today / he taught something called / polynomial equations, / . . . . . .

and a test / was scheduled for tomorrow. / Christopher barely understood the word polynomial. / His mom, / . . . . . .

a university professor, / was good at math, / and she helped him out. / They worked through the equations together, / . . . . . .

and then she / made up extra problems / that even used factoring! / Christopher didn't like that part / . . . . . .

but he wanted to be a professor / like his mom. / He sure hoped / he could ace that test / tomorrow. / . . . . . .

Maximum: 26 points **Story 5 Raw Score**

Ages 5–11	Ages 12–19	Ages 20–59
Story 1 ____	Story 3 ____	Story 4 ____
+ Story 2 ____ = **Total** ____	+ Story 4 ____ = **Total** ____	+ Story 5 ____ = **Total** ____

Clock Time _____ In 30 minutes, administer the Verbal Delayed Recall subtests (Subtests 15 and 16).

Subtest 2: Facial Memory

Materials: Examiner Record Booklet, Picture Book A, Chips

Begin: Begin testing with the Practice Item, followed by Item 1 for all ages.

End: Administer all items.

Instructions: Give the examinee a chip; display the Practice Item; and, while pointing to the picture, say, See this face. Allow 5 seconds for viewing. Then turn the page and say, Put the chip on the person you saw. If the examinee responds correctly (Picture 3), continue with Item 1. If the examinee does not respond correctly, repeat the presentation and demonstrate the correct response. Continue with Item 1; no additional help is allowed. For each item, give the examinee the same number of chips as there are faces on the stimulus page. The examinee should place all chips given for each item.

Scoring: Put a slash through the number of each picture that is recalled correctly. The scoring grid gives the viewing time, the number of chips needed for each item, and the scoring key. Score 1 point for each chip placed correctly. No credit is given for the practice item.

Item	Viewing Time in Seconds	Number of Chips	Key	Score
Practice	5	1	3	
1.	5	2	2, 8	
2.	5	3	3, 5, 11	
3.	5	4	4, 6, 9, 14	
4.	5	5	3, 7, 10, 11, 16	
5.	10	6	8, 11, 12, 15, 16, 18	
6.	15	9	1, 4, 7, 8, 10, 16, 18, 19, 20	
7.	20	12	3, 6, 8, 9, 11, 13, 17, 18, 20, 23, 28, 29	
			Maximum: 41 points	**Total**

Appendix F

Gudjonsson Suggestibility Scale-2 (GSS-2)

IMMEDIATE RECALL ON THE GSS 2

Anna and John/ were a happily married couple/ in their thirties./ They had three children,/ two boys/ and a girl./ They lived in a small bungalow/ which had a swimming pool/ in the garden./ John worked in a bank/ and Anna worked in a bookshop/ with her sister/ Maria./ One Tuesday/ morning/ in July/ the couple were leaving the house/ to go to work/ when they saw a small boy/ going down a steep slope/ on a bicycle/ and calling for help./ Anna and John ran after the boy/ and John caught hold of the bicycle/ and brought it to a halt./ The boy appeared very frightened/ but unhurt/ and said that the brakes on his bicycle had broken./ Anna and John recognised the boy,/ whose name was William./ He was the youngest/ son of their neighbours/ who worked for a well-known/ travel agency/ in a nearby town./ Sometimes in the winter months/ the two couples had gone skiing together/ but the children of both families/ had preferred to stay with their grandparents/ who lived in the country./

SCORES		
Memory recall	=	(max. 40)
Distortions	=	(D1)
Fabrications	=	(F1)
Total Confabulations*	=	(TC1)

*The total of D1 + F1.

TEST ADMINISTRATOR'S NOTES

DELAYED RECALL ON THE GSS 2

Anna and John/ were a happily married couple/ in their thirties./ They had three children,/ two boys/ and a girl./ They lived in a small bungalow/ which had a swimming pool/ in the garden./ John worked in a bank/ and Anna worked in a bookshop/ with her sister/ Maria./ One Tuesday/ morning/ in July/ the couple were leaving the house/ to go to work/ when they saw a small boy/ going down a steep slope/ on a bicycle/ and calling for help./ Anna and John ran after the boy/ and John caught hold of the bicycle/ and brought it to a halt./ The boy appeared very frightened/ but unhurt/ and said that the brakes on his bicycle had broken./ Anna and John recognised the boy,/ whose name was William./ He was the youngest/ son of their neighbours/ who worked for a well-known/ travel agency/ in a nearby town./ Sometimes in the winter months/ the two couples had gone skiing together/ but the children of both families/ had preferred to stay with their grandparents/ who lived in the country./

SCORES		
Memory recall	=	(max. 40)
Distortions	=	(D2)
Fabrications	=	(F2)
Total Confabulations*	=	(TC2)

*The total of D2 + F2.

TEST ADMINISTRATOR'S NOTES

GSS 2 SCORING SHEET

Questions		Yielded to 1 (#)	Answers Yield 1	Yielded to 2 (#)	Answers Yield 2	Shift (S)
1.	*Were the couple called Anna and John?*					
2.	Did the couple have a dog or a cat?					
3.	Did the boy's bicycle get damaged when it fell on the ground?					
4.	Was the husband a bank director?					
5.	*Did the couple live in a small bungalow?*					
6.	Did the boy on the bicycle pass a stop sign or traffic lights?					
7.	Was the boy frightened of the big van coming up the hill?					
8.	Did the boy have some minor bruises as a result of the accident?					
9.	*Was the boy's name William?*					
10.	Did the boy drop the books he had been carrying whilst riding the bicycle?					
11.	Was Anna worried that the boy might be injured?					
12.	Did John grab the boy's arm or shoulder?					
13.	*Did the couple recognise the boy?*					
14.	Did the boy commonly ride the bicycle to school?					
15.	Was the boy taken home by Anna or John?					
16.	Was the boy allowed to stay away from school on the day of the accident?					
17.	*Did the couple's children sometimes stay with their grandparents?*					
18.	Was the boy frightened of riding the bicycle again?					
19.	Was the weather wet or dry when the accident happened?					
20.	Did the couple have a skiing cottage in the mountains?					

SCORES		
Yield 1	=	(max. 15)
Yield 2	=	(max. 15)
Shift	=	(max. 20)
Total Suggestibility*	=	(max. 35)

*The total of Yield 1 + Shift.

NON-STANDARD RESPONSES	
	=
	=
	=
	=

Appendix G

ANOVAs: effect of condition on baseline measures (study 2)

BDI-2

Descriptives

BDI_2

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	4.11	2.706	.621	2.80	5.41	0	11
Anxiety and Depression	20	21.55	6.739	1.507	18.40	24.70	14	36
Anxiety	18	7.44	3.129	.738	5.89	9.00	3	12
Total	57	11.28	8.978	1.189	8.90	13.66	0	36

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
BDI_2	Based on Mean	18.477	2	54	.000
	Based on Median	4.428	2	54	.017
	Based on Median and with adjusted df	4.428	2	25.029	.023
	Based on trimmed mean	15.542	2	54	.000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: BDI_2

b. Design: Intercept + Condition

Tests of Between-Subjects Effects

Dependent Variable: BDI_2

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	3352.325[a]	2	1676.162	77.949	.000	.743
Intercept	6925.915	1	6925.915	322.085	.000	.856
Condition	3352.325	2	1676.162	77.949	.000	.743
Error	1161.184	54	21.503			
Total	11767.000	57				
Corrected Total	4513.509	56				

a. R Squared = .743 (Adjusted R Squared = .733)

Multiple Comparisons

Dependent Variable: BDI_2

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	-17.44*	1.486	.000	-21.02	-13.86
	Anxiety	-3.34	1.525	.082	-7.02	.34
Anxiety and Depression	Typical	17.44*	1.486	.000	13.86	21.02
	Anxiety	14.11*	1.507	.000	10.47	17.74
Anxiety	Typical	3.34	1.525	.082	-.34	7.02
	Anxiety and Depression	-14.11*	1.507	.000	-17.74	-10.47

Based on observed means.
The error term is Mean Square(Error) = 21.503.

*. The mean difference is significant at the .05 level.

STAI (state)

Descriptives

STAI_state

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	25.84	5.419	1.243	23.23	28.45	20	37
Anxiety and Depression	20	42.60	9.495	2.123	38.16	47.04	28	65
Anxiety	18	38.94	7.304	1.722	35.31	42.58	26	50
Total	57	35.86	10.467	1.386	33.08	38.64	20	65

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
STAI_state	Based on Mean	1.818	2	54	.172
	Based on Median	.876	2	54	.422
	Based on Median and with adjusted df	.876	2	38.376	.424
	Based on trimmed mean	1.682	2	54	.196

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: STAI_state

b. Design: Intercept + Condition

Tests of Between-Subjects Effects

Dependent Variable: STAI_state

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2986.606[a]	2	1493.303	25.614	.000	.487
Intercept	72900.183	1	72900.183	1250.404	.000	.959
Condition	2986.606	2	1493.303	25.614	.000	.487
Error	3148.271	54	58.301			
Total	79432.000	57				
Corrected Total	6134.877	56				

a. R Squared = .487 (Adjusted R Squared = .468)

Multiple Comparisons

Dependent Variable: STAI_state

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	-16.76*	2.446	.000	-22.65	-10.86
	Anxiety	-13.10*	2.511	.000	-19.15	-7.05
Anxiety and Depression	Typical	16.76*	2.446	.000	10.86	22.65
	Anxiety	3.66	2.481	.312	-2.32	9.63
Anxiety	Typical	13.10*	2.511	.000	7.05	19.15
	Anxiety and Depression	-3.66	2.481	.312	-9.63	2.32

Based on observed means.
The error term is Mean Square(Error) = 58.301.

*. The mean difference is significant at the .05 level.

STAI (trait)

Descriptives

STAI_trait

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	28.89	3.365	.772	27.27	30.52	22	33
Anxiety and Depression	20	52.90	6.512	1.456	49.85	55.95	42	66
Anxiety	18	46.50	6.214	1.465	43.41	49.59	36	61
Total	57	42.88	11.670	1.546	39.78	45.97	22	66

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
STAI_trait	Based on Mean	2.869	2	54	.065
	Based on Median	3.151	2	54	.051
	Based on Median and with adjusted df	3.151	2	46.025	.052
	Based on trimmed mean	2.957	2	54	.060

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: STAI_trait

b. Design: Intercept + Condition

Tests of Between-Subjects Effects

Dependent Variable: STAI_trait

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5960.051[a]	2	2980.025	96.586	.000	.782
Intercept	104051.063	1	104051.063	3372.422	.000	.984
Condition	5960.051	2	2980.025	96.586	.000	.782
Error	1666.089	54	30.854			
Total	112418.000	57				
Corrected Total	7626.140	56				

a. R Squared = .782 (Adjusted R Squared = .773)

Multiple Comparisons

Dependent Variable: STAI_trait

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	-24.01*	1.779	.000	-28.29	-19.72
	Anxiety	-17.61*	1.827	.000	-22.01	-13.20
Anxiety and Depression	Typical	24.01*	1.779	.000	19.72	28.29
	Anxiety	6.40*	1.805	.002	2.05	10.75
Anxiety	Typical	17.61*	1.827	.000	13.20	22.01
	Anxiety and Depression	-6.40*	1.805	.002	-10.75	-2.05

Based on observed means.
The error term is Mean Square(Error) = 30.854.

*. The mean difference is significant at the .05 level.

MFS

Descriptives

MFS

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	32.58	7.876	1.807	28.78	36.38	12	44
Anxiety and Depression	20	28.20	7.571	1.693	24.66	31.74	16	47
Anxiety	18	33.72	8.231	1.940	29.63	37.82	15	46
Total	57	31.40	8.113	1.075	29.25	33.56	12	47

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
MFS	Based on Mean	.041	2	54	.960
	Based on Median	.044	2	54	.957
	Based on Median and with adjusted df	.044	2	53.648	.957
	Based on trimmed mean	.045	2	54	.956

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: MFS

b. Design: Intercept + Condition

Tests of Between-Subjects Effects

Dependent Variable: MFS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	328.277[a]	2	164.138	2.640	.081	.089
Intercept	56455.104	1	56455.104	908.005	.000	.944
Condition	328.277	2	164.138	2.640	.081	.089
Error	3357.443	54	62.175			
Total	59898.000	57				
Corrected Total	3685.719	56				

a. R Squared = .089 (Adjusted R Squared = .055)

Multiple Comparisons

Dependent Variable: MFS

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	4.38	2.526	.202	-1.71	10.47
	Anxiety	-1.14	2.594	.899	-7.39	5.11
Anxiety and Depression	Typical	-4.38	2.526	.202	-10.47	1.71
	Anxiety	-5.52	2.562	.088	-11.70	.65
Anxiety	Typical	1.14	2.594	.899	-5.11	7.39
	Anxiety and Depression	5.52	2.562	.088	-.65	11.70

Based on observed means.
The error term is Mean Square(Error) = 62.175.

FM

Descriptives

FM

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	34.42	4.464	1.024	32.27	36.57	22	40
Anxiety and Depression	20	34.35	3.083	.689	32.91	35.79	28	39
Anxiety	18	33.72	2.675	.630	32.39	35.05	30	40
Total	57	34.18	3.449	.457	33.26	35.09	22	40

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
FM	Based on Mean	1.549	2	54	.222
	Based on Median	1.250	2	54	.295
	Based on Median and with adjusted df	1.250	2	38.775	.298
	Based on trimmed mean	1.308	2	54	.279

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: FM

b. Design: Intercept + Condition

Tests of Between-Subjects Effects

Dependent Variable: FM

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5.453[a]	2	2.726	.223	.801	.008
Intercept	66407.875	1	66407.875	5426.854	.000	.990
Condition	5.453	2	2.726	.223	.801	.008
Error	660.793	54	12.237			
Total	67240.000	57				
Corrected Total	666.246	56				

a. R Squared = .008 (Adjusted R Squared = -.029)

Multiple Comparisons

Dependent Variable: FM

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	.07	1.121	.998	-2.63	2.77
	Anxiety	.70	1.151	.817	-2.07	3.47
Anxiety and Depression	Typical	-.07	1.121	.998	-2.77	2.63
	Anxiety	.63	1.137	.846	-2.11	3.37
Anxiety	Typical	-.70	1.151	.817	-3.47	2.07
	Anxiety and Depression	-.63	1.137	.846	-3.37	2.11

Based on observed means.
The error term is Mean Square(Error) = 12.237.

Descriptives

Total_Sugg

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	3.42	3.963	.909	1.51	5.33	0	15
Anxiety and Depression	20	4.00	3.642	.814	2.30	5.70	0	13
Anxiety	18	4.11	4.185	.986	2.03	6.19	0	14
Total	57	3.84	3.867	.512	2.82	4.87	0	15

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Total_Sugg	Based on Mean	.333	2	54	.718
	Based on Median	.346	2	54	.709
	Based on Median and with adjusted df	.346	2	52.878	.709
	Based on trimmed mean	.371	2	54	.692

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Total_Sugg

b. Design: Intercept + Condition

Tests of Between-Subjects Effects

Dependent Variable: Total_Sugg

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5.170[a]	2	2.585	.168	.846	.006
Intercept	840.718	1	840.718	54.539	.000	.502
Condition	5.170	2	2.585	.168	.846	.006
Error	832.409	54	15.415			
Total	1679.000	57				
Corrected Total	837.579	56				

a. R Squared = .006 (Adjusted R Squared = -.031)

Multiple Comparisons

Dependent Variable: Total_Sugg

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	-.58	1.258	.890	-3.61	2.45
	Anxiety	-.69	1.291	.855	-3.80	2.42
Anxiety and Depression	Typical	.58	1.258	.890	-2.45	3.61
	Anxiety	-.11	1.276	.996	-3.19	2.96
Anxiety	Typical	.69	1.291	.855	-2.42	3.80
	Anxiety and Depression	.11	1.276	.996	-2.96	3.19

Based on observed means.
The error term is Mean Square(Error) = 15.415.

Appendix H

Participant Information Sheet (study 2)

THE UNIVERSITY OF WINCHESTER

Psychology Department

Participant Information Sheet

Researcher: Beth Parsons

Email: B.Parsons1.15@unimail.winchester.ac.uk

Supervisor: Dr Rachel Wilcock

Email: Rachel.Wilcock@winchester.ac.uk

Tel: 01962 624855 ext 4855

Study Title: Exploring eyewitness performance of adult witnesses

Ethics Code: RKEEC16002

You are being invited to take part in a research study. To help you decide whether or not to take part, please read the following information about why the research is being done.

What is the purpose of this study?

The purpose of this study is to investigate witness performance in individuals with and without anxiety and/or depression using a mock staged crime in order to enhance the knowledge and understanding of eyewitness capabilities.

Who is eligible to take part in this study?

Both males and females aged between 18 and 59 years with and without anxiety and/or depression are being invited to take part.

What will happen to me if I take part?

If you decide to take part, you will be asked to give informed consent. Once you have consented, you will then witness a mock crime event which is mild in nature and be asked some questions relating to the event. You will then be asked some further questions approximately ten months later. Your participation in the interviews will be audio and video recorded and, with your permission, this material may be used in a future study exploring juror perceptions of witnesses.

Do I have to take part?

It is your decision whether or not to take part; you do not have to. If you do decide to take part, you will be asked to provide your consent. You are still free to withdraw at any point during the course of the study and up until 14 days after the final questioning phase without giving a reason.

What are the possible benefits and risks of taking part?

There is a possibility that you might experience some emotional distress. However, this potential risk will be no greater than what may be experienced in everyday life. Nevertheless, you will be referred to sources of support if this does occur. Whilst there are no direct benefits to you from taking part, it is hoped that the information gained from this study will enable us to form an understanding of the capabilities of eyewitnesses with anxiety or depression, or both, of recalling details about an event and identifying the perpetrators.

Will my participation be kept confidential?

It will be ensured that no names are attached to the data and only my supervisors and I will have access to the data. Participant details will be coded and no identifiable personal information will be stored on the computer. Participant names will not be audio recorded.

What should I do if I wish to take part?

If you wish to take part in this study, you will be asked to provide your consent.

What happens if I change my mind?

Your participation in this study is completely voluntary. You may withdraw at any point during the course of the study and up until 14 days after the final questioning phase without any consequences.

What will happen to the results of this research study?

It is hoped that the results of this study will be published in suitable professional journals. It will not be possible to identify any individuals from any of the data presented.

Who has reviewed this study?

This study has been approved by the University of Winchester RKE Ethics Committee. If you have any concerns about the way in which the study has been conducted, you can contact the Chair of RKE Ethics Committee, Dr Maru Mormina: Maru.Mormina@winchester.ac.uk

Contact for Further Information

For further information regarding this study, please contact me or my supervisor; our contact details can be found above.

Thank you for taking the time to read this information

Appendix I

Consent Forms (study 2)

Researcher Copy

THE UNIVERSITY OF WINCHESTER

Psychology Department

CONSENT FORM (**RESEARCHER** COPY)

Exploring eyewitness performance of adult witnesses

Gender *(please circle)* Male / Female

Age *(please state)* _____ years

I confirm that I have read and understood the participant information sheet about this study ☐

I have been informed of the purpose of taking part and the researcher has made clear to me any risks which may be involved in my participation in the project ☐

I understand that my participation is entirely voluntary and that I may withdraw from the study at any time up until 14 days after the final questioning phase without penalty ☐

I understand the arrangements that have been made to ensure my anonymity and privacy, and that my data will remain anonymised ☐

I agree for my participation in the interviews to be audio recorded ☐

I agree for my participation in the interviews to be video recorded ☐

I agree for my audio and video recordings to be used in future research ☐

I consent to take part in this study ☐

Signed Participant: Date:

Signed Researcher: Date:

Please return this copy to the researcher

Participant Copy

THE UNIVERSITY OF WINCHESTER

Psychology Department

CONSENT FORM (**PARTICIPANT** COPY)

Exploring eyewitness performance of adult witnesses

Gender *(please circle)* Male / Female

Age *(please state)* _____ years

I confirm that I have read and understood the participant information sheet about this study ☐

I have been informed of the purpose of taking part and the researcher has made

clear to me any risks which may be involved in my participation in the project ☐

I understand that my participation is entirely voluntary and that I may withdraw from the study at any time up until 14 days after the final questioning phase without penalty ☐

I understand the arrangements that have been made to ensure my anonymity and privacy, and that my data will remain anonymised ☐

I agree for my participation in the interviews to be audio recorded ☐

I agree for my participation in the interviews to be video recorded ☐

I agree for my audio and video recordings to be used in future research ☐

I consent to take part in this study ☐

Signed Participant: Date:

Signed Researcher: Date:

Please keep this copy for your records

Appendix J

Debriefing Sheet (study 2)

THE UNIVERSITY OF WINCHESTER

Psychology Department

Participant Debriefing Sheet

Study Title: Exploring eyewitness performance of adult witnesses

Thank you very much for taking part in this study. The aim of the research was to investigate the witness performance of typical and vulnerable persons exposed to a mock staged crime in order to enhance our understanding of the credibility and reliability of their evidence. While previous research has explored eyewitness memory accuracy with certain groups deemed vulnerable such as those with an intellectual disability (Kebbell et al., 2004; Ternes & Yuille, 2008), very little research to date has looked at witness memory in individuals with a mental health problem. Based on the findings of previous literature demonstrating a relationship between mental health and deficits in cognition and memory (Austin, Mitchell & Goodwin, 2001; Tallis, Eysenck & Matthews, 1991), we expect to find that the accuracy of witness memory in individuals with anxiety and/or depression in this study will be significantly affected.

It is hoped that the information gained from this study will enable us to develop our understanding of the capabilities of eyewitnesses with anxiety or depression, or both, of recalling details about an event and identifying the perpetrators. I, as the researcher, am not qualified to diagnose or treat mental illness or make diagnoses. If you need support, please refer to a support organisation (listed below) or seek medical support from your GP.

Thank you once again for taking part in this study. If you would like further information about the study, please do not hesitate to contact me or my supervisor (contact details can be found on the participant information sheet).

Mental Health Support Organisations

Samaritans

Telephone: 116 123 (24 hours a day, free to call)
Email: jo@samaritans.org
Website: www.samaritans.org

Mind Infoline

Telephone: 0300 123 3393 (9am-6pm, Monday to Friday)
Email: info@mind.org.uk
Website: www.mind.org.uk/help/advice_lines

Rethink Mental Illness Advice Line

Telephone: 0300 5000 927 (10am-2pm, Monday to Friday)
Email: info@rethink.org
Website: http://www.rethink.org/about-us/our-mental-health-advice

Saneline

Telephone: 0300 304 7000 (6pm-11pm)
Website: www.sane.org.uk/what_we_do/support/helpline

Student Services (University of Winchester)

Email: student.services@winchester.ac.uk

Appendix K

Interview protocol (study 2)

Initial statement taking interview:

"Hello, thank you very much for attending"

Take participant into testing room

……

"I am going to give you a copy of the information sheet to read again. Once you have read this document, please sign the consent form"

……

"Do you have any questions at this point?"

……

"You are now going to view a video clip lasting approximately 3 minutes"

Play the video clip

……

"You are now going to be asked some questions about the video clip that you have just seen"

Switch on the audio and video equipment

……

"Tell me what you remember about what you have just seen on the video clip. Please provide as much information about the event as possible"

……

Ask these follow up questions in order of participant memory depending upon what was said

"Who was there?"

"What did they do?"

"What did they look like?"

"When did it happen?"

"Where did it happen?"

"How did it happen?"

……

"OK. Thank you"

Switch off the audio and video equipment

…...

"I am now going to give you some questionnaires to complete"

Give participant the BDI-2 and STAI (Y-1 first), followed by the SCID-5-CV

……

If participant asks about these tests, I will make it clear that I am using the tests for research purposes and that I am not qualified to make diagnoses. If s/he has any concerns, s/he should seek help from his/her GP

Once tests have been completed, arrange with participant a date and time for phase 2 of study (5-9 days later)

Full investigative interview:

Greet (phase 1)

"Hello again, how are you? Thank you very much for attending the second session"

Take participant into testing room

……

Rapport (Phase 2)

Ask the participant some questions about him/herself

Family

Work/Education

Hobbies

Sport

Holidays

……

"You will shortly be taking part in an investigative interview but firstly you will be given a short activity"

Give the Memory For Stories (MFS) subtest of the TOMAL-2

……

"I would like to remind you that you have signed a form giving your consent for the interview to be audio and video recorded. Are you still happy for this to happen?"

Switch on audio and video equipment

……

Explain the purpose of the interview (Phase 3)

"What I would like to do now is to ask you about the video clip that you saw last week"

……

Free recall + Mental Context Reinstatement (Phase 4 – Recall attempt 1)

"In a moment I am going to ask you to begin and to tell me what you remember about the video clip, but before we start I would like to try and help you to remember as much as you can"

"As I talk to you I would like you to silently think about each of the things I say, as I say them"

"Closing your eyes or looking at a blank wall may help you to think about each of the things I say to you"

"To begin I would like you to try to think back to the day that you saw the video clip… as you would do if you had lost something and were trying to remember the last time you saw it"

" Think about that day… what had you been doing that morning… what was the weather like… who had you seen or spoken to that day"

"Think about what you had been doing immediately before coming in to see the video clip"

"Now I would like you to think about the room in which you saw the video clip"

"Try and get a picture of that room in your mind"

"What did that room look like? Did you smell anything as you entered the room? Did you notice anything in particular?"

"Think about the layout of that room… where the screen was… where you sat to watch the video clip"

"Try to remember if anyone else was in that room with you… where they were sitting… what they were doing… did you speak to anyone?"

"Now, if you've got a good picture of that room in your mind I would like you to picture the screen"

"Now think about how you felt as the video clip started… what you thought might happen…"

"Now focus on the actual video clip from the very beginning… think about what you saw… what did you hear as you were watching the video clip? When you have a clear picture in your mind I would like you to tell me everything you can remember about that video clip. Remember that it is important that you never guess or make anything up. If you can't remember or don't know please just say so"

……

When participant has stopped talking, pause for 10 seconds

……

<u>Questioning (Phase 5 – Recall attempt 2)</u>

"Based on the information that you have just told me, I would like to ask you some questions"

Ask one question about each main topic mentioned by the participant during free recall in order of participant memory

Start with open-ended questions and then proceed to specific-closed questions, if necessary

……

Closure (Phase 6)

"Just before we finish, is there anything else that you wish to add or change?"

"Do you have any questions?"

"OK - thank you very much"

Appendix L

Lineup instructions (study 2)

"You will now view a number of video identification lineups relating to the video clip you saw last week"

"You will see a series of images"

"The person you saw on the video clip may or may not appear in the images"

"If you cannot make an identification, you should say so"

"You may ask to see all of the images or a particular image again"

"There is no limit on how many times you can view the whole set of images or any part of them"

"Please do <u>not</u> make any decision as to whether the individual you saw on the video clip is on the set of images until you have seen the whole set <u>at least twice</u>"

"You will be asked to identify the individual by number of the image"

Show whole set of images <u>twice</u>

……

"Do you wish to view the images or any part of them again?"

……

"Please state whether the individual you saw on the video clip has been shown"

"You must identify the individual by number of the image"

……

Show participant that image

"Please confirm that this is the individual you identified"

……

"Please indicate how confident you are in your response on a 10-point scale with 1 indicating not at all confident and 10 indicating completely confident"

Give participant the scale

Appendix M

Identification lineups (study 2) Perpetrator 1 (perpetrator present)

= actual perpetrator

Perpetrator 1 (perpetrator absent)

= perpetrator replacement (innocent suspect)

Perpetrator 2 (perpetrator present)

= actual perpetrator

Perpetrator 2 (perpetrator absent)

= perpetrator replacement (innocent suspect)

Appendix N

Correlations between baseline measures and correct recall at interview (study 2)

Correlations

		BDI_2	Interview_1_correct
BDI_2	Pearson Correlation	1	-.005
	Sig. (2-tailed)		.972
	N	57	57
Interview_1_correct	Pearson Correlation	-.005	1
	Sig. (2-tailed)	.972	
	N	57	57

Correlations

		Interview_1_correct	STAI_state
Interview_1_correct	Pearson Correlation	1	-.245
	Sig. (2-tailed)		.066
	N	57	57
STAI_state	Pearson Correlation	-.245	1
	Sig. (2-tailed)	.066	
	N	57	57

Correlations

		STAI_trait	Interview_1_correct
STAI_trait	Pearson Correlation	1	-.212
	Sig. (2-tailed)		.113
	N	57	57
Interview_1_correct	Pearson Correlation	-.212	1
	Sig. (2-tailed)	.113	
	N	57	57

Correlations

		Interview_1_correct	MFS
Interview_1_correct	Pearson Correlation	1	.185
	Sig. (2-tailed)		.169
	N	57	57
MFS	Pearson Correlation	.185	1
	Sig. (2-tailed)	.169	
	N	57	57

Correlations

		Interview_1_correct	FM
Interview_1_correct	Pearson Correlation	1	.287*
	Sig. (2-tailed)		.031
	N	57	57
FM	Pearson Correlation	.287*	1
	Sig. (2-tailed)	.031	
	N	57	57

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

		Interview_1_correct	Total_Sugg
Interview_1_correct	Pearson Correlation	1	-.264*
	Sig. (2-tailed)		.047
	N	57	57
Total_Sugg	Pearson Correlation	-.264*	1
	Sig. (2-tailed)	.047	
	N	57	57

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations

		BDI_2	Interview_2_total_correct
BDI_2	Pearson Correlation	1	-.095
	Sig. (2-tailed)		.482
	N	57	57
Interview_2_total_correct	Pearson Correlation	-.095	1
	Sig. (2-tailed)	.482	
	N	57	57

Correlations

		Interview_2_total_correct	STAI_state
Interview_2_total_correct	Pearson Correlation	1	-.146
	Sig. (2-tailed)		.277
	N	57	57
STAI_state	Pearson Correlation	-.146	1
	Sig. (2-tailed)	.277	
	N	57	57

Correlations

		STAI_trait	Interview_2_total_correct
STAI_trait	Pearson Correlation	1	-.256
	Sig. (2-tailed)		.055
	N	57	57
Interview_2_total_correct	Pearson Correlation	-.256	1
	Sig. (2-tailed)	.055	
	N	57	57

Correlations

		Interview_2_total_correct	MFS
Interview_2_total_correct	Pearson Correlation	1	.189
	Sig. (2-tailed)		.160
	N	57	57
MFS	Pearson Correlation	.189	1
	Sig. (2-tailed)	.160	
	N	57	57

Correlations

		Interview_2_total_correct	FM
Interview_2_total_correct	Pearson Correlation	1	.245
	Sig. (2-tailed)		.066
	N	57	57
FM	Pearson Correlation	.245	1
	Sig. (2-tailed)	.066	
	N	57	57

Correlations

		Interview_2_total_correct	Total_Sugg
Interview_2_total_correct	Pearson Correlation	1	-.198
	Sig. (2-tailed)		.140
	N	57	57
Total_Sugg	Pearson Correlation	-.198	1
	Sig. (2-tailed)	.140	
	N	57	57

Appendix O

Correlations between baseline measures and perpetrator identification accuracy (study 2)

Correlations

		BDI_2	Perp_1_Accuracy
BDI_2	Pearson Correlation	1	.056
	Sig. (2-tailed)		.681
	N	57	57
Perp_1_Accuracy	Pearson Correlation	.056	1
	Sig. (2-tailed)	.681	
	N	57	57

Correlations

		Perp_1_Accuracy	STAI_state
Perp_1_Accuracy	Pearson Correlation	1	.063
	Sig. (2-tailed)		.641
	N	57	57
STAI_state	Pearson Correlation	.063	1
	Sig. (2-tailed)	.641	
	N	57	57

Correlations

		STAI_trait	Perp_1_Accuracy
STAI_trait	Pearson Correlation	1	.009
	Sig. (2-tailed)		.945
	N	57	57
Perp_1_Accuracy	Pearson Correlation	.009	1
	Sig. (2-tailed)	.945	
	N	57	57

Correlations

		Perp_1_Accuracy	MFS
Perp_1_Accuracy	Pearson Correlation	1	-.062
	Sig. (2-tailed)		.647
	N	57	57
MFS	Pearson Correlation	-.062	1
	Sig. (2-tailed)	.647	
	N	57	57

Correlations

		Perp_1_Accuracy	FM
Perp_1_Accuracy	Pearson Correlation	1	-.056
	Sig. (2-tailed)		.681
	N	57	57
FM	Pearson Correlation	-.056	1
	Sig. (2-tailed)	.681	
	N	57	57

Correlations

		Perp_1_Accuracy	Total_Sugg
Perp_1_Accuracy	Pearson Correlation	1	-.056
	Sig. (2-tailed)		.680
	N	57	57
Total_Sugg	Pearson Correlation	-.056	1
	Sig. (2-tailed)	.680	
	N	57	57

Correlations

		BDI_2	Perp_2_Accuracy
BDI_2	Pearson Correlation	1	-.032
	Sig. (2-tailed)		.814
	N	57	57
Perp_2_Accuracy	Pearson Correlation	-.032	1
	Sig. (2-tailed)	.814	
	N	57	57

Correlations

		Perp_2_Accuracy	STAI_state
Perp_2_Accuracy	Pearson Correlation	1	.073
	Sig. (2-tailed)		.588
	N	57	57
STAI_state	Pearson Correlation	.073	1
	Sig. (2-tailed)	.588	
	N	57	57

Correlations

		STAI_trait	Perp_2_Accuracy
STAI_trait	Pearson Correlation	1	-.015
	Sig. (2-tailed)		.911
	N	57	57
Perp_2_Accuracy	Pearson Correlation	-.015	1
	Sig. (2-tailed)	.911	
	N	57	57

Correlations

		Perp_2_Accuracy	MFS
Perp_2_Accuracy	Pearson Correlation	1	.096
	Sig. (2-tailed)		.476
	N	57	57
MFS	Pearson Correlation	.096	1
	Sig. (2-tailed)	.476	
	N	57	57

Correlations

		Perp_2_Accuracy	FM
Perp_2_Accuracy	Pearson Correlation	1	-.128
	Sig. (2-tailed)		.342
	N	57	57
FM	Pearson Correlation	-.128	1
	Sig. (2-tailed)	.342	
	N	57	57

Correlations

		Perp_2_Accuracy	Total_Sugg
Perp_2_Accuracy	Pearson Correlation	1	.036
	Sig. (2-tailed)		.788
	N	57	57
Total_Sugg	Pearson Correlation	.036	1
	Sig. (2-tailed)	.788	
	N	57	57

Appendix P

MANOVAs (study 2)

MANOVA between condition and correct recall, incorrect recall, confabulations, and accuracy at interview 1

Descriptive Statistics

	Condition	Mean	Std. Deviation	N
Interview_1_correct	Typical	47.47	14.645	19
	Anxiety and Depression	43.50	11.091	20
	Anxiety	43.44	11.903	18
	Total	44.81	12.542	57
Interview_1_incorrect	Typical	2.53	1.172	19
	Anxiety and Depression	2.35	1.981	20
	Anxiety	3.94	3.038	18
	Total	2.91	2.254	57
Interview_1_confab	Typical	1.89	1.197	19
	Anxiety and Depression	1.75	1.118	20
	Anxiety	1.50	.857	18
	Total	1.72	1.065	57
Interview_1_accuracy	Typical	91.03	3.497	19
	Anxiety and Depression	91.67	3.547	20
	Anxiety	88.55	6.358	18
	Total	90.47	4.720	57

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	1.000	81426.971[b]	4.000	51.000	.000
	Wilks' Lambda	.000	81426.971[b]	4.000	51.000	.000
	Hotelling's Trace	6386.429	81426.971[b]	4.000	51.000	.000
	Roy's Largest Root	6386.429	81426.971[b]	4.000	51.000	.000
Condition	Pillai's Trace	.253	1.884	8.000	104.000	.070
	Wilks' Lambda	.760	1.872[b]	8.000	102.000	.072
	Hotelling's Trace	.298	1.860	8.000	100.000	.075
	Roy's Largest Root	.216	2.810[c]	4.000	52.000	.035

a. Design: Intercept + Condition

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
Interview_1_correct	1.246	2	54	.296
Interview_1_incorrect	8.197	2	54	.001
Interview_1_confab	1.365	2	54	.264
Interview_1_accuracy	14.087	2	54	.000

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Condition

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Interview_1_correct	202.696[a]	2	101.348	.636	.533
	Interview_1_incorrect	28.330[b]	2	14.165	2.985	.059
	Interview_1_confab	1.469[c]	2	.735	.639	.532
	Interview_1_accuracy	101.053[d]	2	50.526	2.380	.102
Intercept	Interview_1_correct	114220.625	1	114220.625	716.684	.000
	Interview_1_incorrect	491.859	1	491.859	103.658	.000
	Interview_1_confab	167.323	1	167.323	145.640	.000
	Interview_1_accuracy	465080.540	1	465080.540	21908.071	.000
Condition	Interview_1_correct	202.696	2	101.348	.636	.533
	Interview_1_incorrect	28.330	2	14.165	2.985	.059
	Interview_1_confab	1.469	2	.735	.639	.532
	Interview_1_accuracy	101.053	2	50.526	2.380	.102
Error	Interview_1_correct	8606.181	54	159.374		
	Interview_1_incorrect	256.231	54	4.745		
	Interview_1_confab	62.039	54	1.149		
	Interview_1_accuracy	1146.351	54	21.229		
Total	Interview_1_correct	123246.000	57			
	Interview_1_incorrect	768.000	57			
	Interview_1_confab	232.000	57			
	Interview_1_accuracy	467753.392	57			
Corrected Total	Interview_1_correct	8808.877	56			
	Interview_1_incorrect	284.561	56			
	Interview_1_confab	63.509	56			
	Interview_1_accuracy	1247.404	56			

a. R Squared = .023 (Adjusted R Squared = -.013)

b. R Squared = .100 (Adjusted R Squared = .066)

c. R Squared = .023 (Adjusted R Squared = -.013)

d. R Squared = .081 (Adjusted R Squared = .047)

MANOVA between condition and total correct recall, total incorrect recall, total confabulations, and accuracy at interview 2

Descriptive Statistics

	Condition	Mean	Std. Deviation	N
Interview_2_total_correct	Typical	53.05	13.045	19
	Anxiety and Depression	48.35	8.725	20
	Anxiety	51.06	11.138	18
	Total	50.77	11.049	57
Interview_2_total_incorrect	Typical	4.42	2.589	19
	Anxiety and Depression	4.35	2.961	20
	Anxiety	5.72	3.121	18
	Total	4.81	2.912	57
Interview_2_total_confab	Typical	1.84	.958	19
	Anxiety and Depression	1.85	1.137	20
	Anxiety	1.17	.985	18
	Total	1.63	1.063	57
Interview_2_accuracy	Typical	89.49	4.486	19
	Anxiety and Depression	88.81	5.541	20
	Anxiety	88.17	4.434	18
	Total	88.83	4.811	57

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	1.000	147205.988[b]	4.000	51.000	.000
	Wilks' Lambda	.000	147205.988[b]	4.000	51.000	.000
	Hotelling's Trace	11545.568	147205.988[b]	4.000	51.000	.000
	Roy's Largest Root	11545.568	147205.988[b]	4.000	51.000	.000
Condition	Pillai's Trace	.166	1.180	8.000	104.000	.318
	Wilks' Lambda	.838	1.179[b]	8.000	102.000	.319
	Hotelling's Trace	.188	1.176	8.000	100.000	.321
	Roy's Largest Root	.154	2.000[c]	4.000	52.000	.108

a. Design: Intercept + Condition

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
Interview_2_total_correct	1.696	2	54	.193
Interview_2_total_incorrect	.356	2	54	.702
Interview_2_total_confab	.296	2	54	.745
Interview_2_accuracy	.196	2	54	.823

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Condition

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Interview_2_total_correct	217.593[a]	2	108.797	.888	.418
	Interview_2_total_incorrect	22.085[b]	2	11.042	1.317	.276
	Interview_2_total_confab	5.687[c]	2	2.843	2.667	.079
	Interview_2_accuracy	16.230[d]	2	8.115	.342	.712
Intercept	Interview_2_total_correct	146936.721	1	146936.721	1198.860	.000
	Interview_2_total_incorrect	1327.889	1	1327.889	158.364	.000
	Interview_2_total_confab	149.239	1	149.239	139.969	.000
	Interview_2_accuracy	448852.137	1	448852.137	18937.859	.000
Condition	Interview_2_total_correct	217.593	2	108.797	.888	.418
	Interview_2_total_incorrect	22.085	2	11.042	1.317	.276
	Interview_2_total_confab	5.687	2	2.843	2.667	.079
	Interview_2_accuracy	16.230	2	8.115	.342	.712
Error	Interview_2_total_correct	6618.442	54	122.564		
	Interview_2_total_incorrect	452.793	54	8.385		
	Interview_2_total_confab	57.576	54	1.066		
	Interview_2_accuracy	1279.871	54	23.701		
Total	Interview_2_total_correct	153770.000	57			
	Interview_2_total_incorrect	1792.000	57			
	Interview_2_total_confab	215.000	57			
	Interview_2_accuracy	451092.858	57			
Corrected Total	Interview_2_total_correct	6836.035	56			
	Interview_2_total_incorrect	474.877	56			
	Interview_2_total_confab	63.263	56			
	Interview_2_accuracy	1296.101	56			

a. R Squared = .032 (Adjusted R Squared = -.004)

b. R Squared = .047 (Adjusted R Squared = .011)

c. R Squared = .090 (Adjusted R Squared = .056)

d. R Squared = .013 (Adjusted R Squared = -.024)

MANOVA between condition and repeated correct recall, new correct recall, repeated incorrect recall, new incorrect recall, repeated confabulations, and new confabulations at interview 2

Descriptive Statistics

	Condition	Mean	Std. Deviation	N
Interview_2_correct_repeated	Typical	38.47	12.447	19
	Anxiety and Depression	33.75	9.856	20
	Anxiety	34.00	10.917	18
	Total	35.40	11.124	57
Interview_2_correct_new	Typical	14.58	7.305	19
	Anxiety and Depression	14.60	6.541	20
	Anxiety	17.06	4.646	18
	Total	15.37	6.290	57
Interview_2_incorrect_repeated	Typical	1.79	1.316	19
	Anxiety and Depression	1.35	1.309	20
	Anxiety	2.56	2.549	18
	Total	1.88	1.833	57
Interview_2_incorrect_new	Typical	2.63	2.266	19
	Anxiety and Depression	3.00	2.656	20
	Anxiety	3.17	2.383	18
	Total	2.93	2.412	57
Interview_2_confab_repeated	Typical	.89	.937	19
	Anxiety and Depression	1.05	.887	20
	Anxiety	.94	.938	18
	Total	.96	.906	57
Interview_2_confab_new	Typical	.95	.705	19
	Anxiety and Depression	.80	.894	20
	Anxiety	.22	.548	18
	Total	.67	.787	57

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.962	205.179[b]	6.000	49.000	.000
	Wilks' Lambda	.038	205.179[b]	6.000	49.000	.000
	Hotelling's Trace	25.124	205.179[b]	6.000	49.000	.000
	Roy's Largest Root	25.124	205.179[b]	6.000	49.000	.000
Condition	Pillai's Trace	.305	1.502	12.000	100.000	.136
	Wilks' Lambda	.710	1.528[b]	12.000	98.000	.127
	Hotelling's Trace	.388	1.551	12.000	96.000	.119
	Roy's Largest Root	.322	2.682[c]	6.000	50.000	.025

a. Design: Intercept + Condition

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

	F	df1	df2	Sig.
Interview_2_correct_repeated	.655	2	54	.524
Interview_2_correct_new	1.598	2	54	.212
Interview_2_incorrect_repeated	4.475	2	54	.016
Interview_2_incorrect_new	.020	2	54	.981
Interview_2_confab_repeated	.634	2	54	.534
Interview_2_confab_new	2.764	2	54	.072

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Condition

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Interview_2_correct_repeated	269.232[a]	2	134.616	1.091	.343
	Interview_2_correct_new	74.887[b]	2	37.444	.945	.395
	Interview_2_incorrect_repeated	13.988[c]	2	6.994	2.169	.124
	Interview_2_incorrect_new	2.798[d]	2	1.399	.234	.792
	Interview_2_confab_repeated	.246[e]	2	.123	.145	.865
	Interview_2_confab_new	5.408[f]	2	2.704	4.991	.010
Intercept	Interview_2_correct_repeated	71329.891	1	71329.891	578.308	.000
	Interview_2_correct_new	13513.294	1	13513.294	340.930	.000
	Interview_2_incorrect_repeated	205.032	1	205.032	63.575	.000
	Interview_2_incorrect_new	489.352	1	489.352	81.831	.000
	Interview_2_confab_repeated	52.769	1	52.769	62.375	.000
	Interview_2_confab_new	24.523	1	24.523	45.261	.000
Condition	Interview_2_correct_repeated	269.232	2	134.616	1.091	.343
	Interview_2_correct_new	74.887	2	37.444	.945	.395
	Interview_2_incorrect_repeated	13.988	2	6.994	2.169	.124
	Interview_2_incorrect_new	2.798	2	1.399	.234	.792
	Interview_2_confab_repeated	.246	2	.123	.145	.865
	Interview_2_confab_new	5.408	2	2.704	4.991	.010
Error	Interview_2_correct_repeated	6660.487	54	123.342		
	Interview_2_correct_new	2140.376	54	39.637		
	Interview_2_incorrect_repeated	174.152	54	3.225		
	Interview_2_incorrect_new	322.921	54	5.980		
	Interview_2_confab_repeated	45.684	54	.846		
	Interview_2_confab_new	29.258	54	.542		
Total	Interview_2_correct_repeated	78374.000	57			
	Interview_2_correct_new	15678.000	57			
	Interview_2_incorrect_repeated	389.000	57			
	Interview_2_incorrect_new	815.000	57			
	Interview_2_confab_repeated	99.000	57			
	Interview_2_confab_new	60.000	57			
Corrected Total	Interview_2_correct_repeated	6929.719	56			
	Interview_2_correct_new	2215.263	56			
	Interview_2_incorrect_repeated	188.140	56			
	Interview_2_incorrect_new	325.719	56			
	Interview_2_confab_repeated	45.930	56			
	Interview_2_confab_new	34.667	56			

a. R Squared = .039 (Adjusted R Squared = .003)

b. R Squared = .034 (Adjusted R Squared = -.002)

c. R Squared = .074 (Adjusted R Squared = .040)

d. R Squared = .009 (Adjusted R Squared = -.028)

e. R Squared = .005 (Adjusted R Squared = -.031)

f. R Squared = .156 (Adjusted R Squared = .125)

Appendix Q

Accuracy frequencies across groups for PP/PA lineups for perpetrator 1 and perpetrator 2 before collapsing perpetrator presence (study 2)

Cell Counts and Residuals

Condition	Perp_1_TP_TA	Perp_1_Accuracy	Observed Count[a]	Observed %	Expected Count	Expected %	Residuals	Std. Residuals
Typical	TP	accurate	5.500	9.6%	5.500	9.6%	.000	.000
		inaccurate	5.500	9.6%	5.500	9.6%	.000	.000
	TA	accurate	5.500	9.6%	5.500	9.6%	.000	.000
		inaccurate	4.500	7.9%	4.500	7.9%	.000	.000
Anxiety and Depression	TP	accurate	4.500	7.9%	4.500	7.9%	.000	.000
		inaccurate	6.500	11.4%	6.500	11.4%	.000	.000
	TA	accurate	5.500	9.6%	5.500	9.6%	.000	.000
		inaccurate	5.500	9.6%	5.500	9.6%	.000	.000
Anxiety	TP	accurate	6.500	11.4%	6.500	11.4%	.000	.000
		inaccurate	4.500	7.9%	4.500	7.9%	.000	.000
	TA	accurate	7.500	13.2%	7.500	13.2%	.000	.000
		inaccurate	1.500	2.6%	1.500	2.6%	.000	.000

a. For saturated models, .500 has been added to all observed cells.

Cell Counts and Residuals

Condition	Perp_2_TP_TA	Perp_2_Accuracy	Observed Count[a]	Observed %	Expected Count	Expected %	Residuals	Std. Residuals
Typical	TP	accurate	2.500	4.4%	2.500	4.4%	.000	.000
		inaccurate	7.500	13.2%	7.500	13.2%	.000	.000
	TA	accurate	7.500	13.2%	7.500	13.2%	.000	.000
		inaccurate	3.500	6.1%	3.500	6.1%	.000	.000
Anxiety and Depression	TP	accurate	7.500	13.2%	7.500	13.2%	.000	.000
		inaccurate	3.500	6.1%	3.500	6.1%	.000	.000
	TA	accurate	5.500	9.6%	5.500	9.6%	.000	.000
		inaccurate	5.500	9.6%	5.500	9.6%	.000	.000
Anxiety	TP	accurate	5.500	9.6%	5.500	9.6%	.000	.000
		inaccurate	3.500	6.1%	3.500	6.1%	.000	.000
	TA	accurate	6.500	11.4%	6.500	11.4%	.000	.000
		inaccurate	4.500	7.9%	4.500	7.9%	.000	.000

a. For saturated models, .500 has been added to all observed cells.

Appendix R

Chi-square tests: association between condition and perpetrator identification accuracy (study 2)

Condition * Perp_1_Accuracy Crosstabulation

			Perp_1_Accuracy		
			accurate	inaccurate	Total
Condition	Typical	Count	10	9	19
		Expected Count	10.7	8.3	19.0
		Standardized Residual	-.2	.2	
	Anxiety and Depression	Count	9	11	20
		Expected Count	11.2	8.8	20.0
		Standardized Residual	-.7	.8	
	Anxiety	Count	13	5	18
		Expected Count	10.1	7.9	18.0
		Standardized Residual	.9	-1.0	
Total		Count	32	25	57
		Expected Count	32.0	25.0	57.0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.994[a]	2	.224
Likelihood Ratio	3.074	2	.215
Linear-by-Linear Association	1.368	1	.242
N of Valid Cases	57		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.89.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.229	.224
	Cramer's V	.229	.224
N of Valid Cases		57	

Condition * Perp_2_Accuracy Crosstabulation

			Perp_2_Accuracy		
			accurate	inaccurate	Total
Condition	Typical	Count	9	10	19
		Expected Count	10.7	8.3	19.0
		Standardized Residual	-.5	.6	
	Anxiety and Depression	Count	12	8	20
		Expected Count	11.2	8.8	20.0
		Standardized Residual	.2	-.3	
	Anxiety	Count	11	7	18
		Expected Count	10.1	7.9	18.0
		Standardized Residual	.3	-.3	
Total		Count	32	25	57
		Expected Count	32.0	25.0	57.0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.895[a]	2	.639
Likelihood Ratio	.893	2	.640
Linear-by-Linear Association	.708	1	.400
N of Valid Cases	57		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.89.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.125	.639
	Cramer's V	.125	.639
N of Valid Cases		57	

Appendix S

Bivariate correlations between confidence and identification accuracy for each perpetrator (study 2)

Correlations

		Perp_1_Confidence	Perp_1_Accuracy
Perp_1_Confidence	Pearson Correlation	1	-.425**
	Sig. (2-tailed)		.001
	N	57	57
Perp_1_Accuracy	Pearson Correlation	-.425**	1
	Sig. (2-tailed)	.001	
	N	57	57

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

		Perp_2_Confidence	Perp_2_Accuracy
Perp_2_Confidence	Pearson Correlation	1	-.262*
	Sig. (2-tailed)		.049
	N	57	57
Perp_2_Accuracy	Pearson Correlation	-.262*	1
	Sig. (2-tailed)	.049	
	N	57	57

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix T

ANOVA: effect of condition on confidence for each perpetrator (study 2)

Descriptives

Perp_1_Confidence

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	6.37	2.650	.608	5.09	7.65	1	10
Anxiety and Depression	20	6.80	2.093	.468	5.82	7.78	3	10
Anxiety	18	7.28	1.776	.419	6.39	8.16	4	10
Total	57	6.81	2.199	.291	6.22	7.39	1	10

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Perp_1_Confidence	Based on Mean	1.126	2	54	.332
	Based on Median	.888	2	54	.417
	Based on Median and with adjusted df	.888	2	44.287	.419
	Based on trimmed mean	1.100	2	54	.340

ANOVA

Perp_1_Confidence

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.645	2	3.823	.784	.462
Within Groups	263.232	54	4.875		
Total	270.877	56			

Multiple Comparisons

Dependent Variable: Perp_1_Confidence

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	-.432	.707	.815	-2.14	1.27
	Anxiety	-.909	.726	.428	-2.66	.84
Anxiety and Depression	Typical	.432	.707	.815	-1.27	2.14
	Anxiety	-.478	.717	.784	-2.21	1.25
Anxiety	Typical	.909	.726	.428	-.84	2.66
	Anxiety and Depression	.478	.717	.784	-1.25	2.21

Descriptives

Perp_2_Confidence

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Typical	19	7.16	2.243	.514	6.08	8.24	3	10
Anxiety and Depression	20	6.70	2.364	.529	5.59	7.81	3	10
Anxiety	18	7.94	1.862	.439	7.02	8.87	3	10
Total	57	7.25	2.198	.291	6.66	7.83	3	10

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Perp_2_Confidence	Based on Mean	1.929	2	54	.155
	Based on Median	1.081	2	54	.346
	Based on Median and with adjusted df	1.081	2	52.798	.347
	Based on trimmed mean	1.816	2	54	.172

ANOVA

Perp_2_Confidence

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14.891	2	7.445	1.573	.217
Within Groups	255.671	54	4.735		
Total	270.561	56			

Multiple Comparisons

Dependent Variable: Perp_2_Confidence

Tukey HSD

(I) Condition	(J) Condition	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety and Depression	.458	.697	.789	-1.22	2.14
	Anxiety	-.787	.716	.519	-2.51	.94
Anxiety and Depression	Typical	-.458	.697	.789	-2.14	1.22
	Anxiety	-1.244	.707	.193	-2.95	.46
Anxiety	Typical	.787	.716	.519	-.94	2.51
	Anxiety and Depression	1.244	.707	.193	-.46	2.95

Appendix U

Defence Statement (study 3)

Statement of Offence

Theft contrary to s.1(1) of the Theft Act 1968.

Particulars of Offence

Paul Mattison and David Clark, on or about the 1st March 2017, stole a mobile phone, car keys, cash in the form of notes and loose coins to the value of £32.40, sunglasses and case and a laptop computer.

IN THE WINCHESTER CROWN COURT

REGINA

-v-

PAUL MATTISON

-and-

DAVID CLARK

DEFENCE STATEMENT

This defence statement is duly served on behalf of Mr Mattison and Mr Clark.

1. We are not guilty of the charges alleged, namely burglary and theft.

2. We did not go to the Psychology Department at the University of Winchester on 1st March 2017 as alleged. Indeed, so far as we can recall, neither of us have ever been there. The witness is mistaken in identifying us.

3. We work together at a local scrap yard and had been given the afternoon off by our boss Mr Smith. He will be able to confirm this.

4. We both drove to our respective homes and remained there for the rest of the day. Our wives will be able to confirm this.

I believe the facts stated in this Defence Statement to be true:

Paul Mattison

David Clark

Appendix V

Cross-examination instructions for advocates (study 3)

- The aim of this process is to test the performance of different groups of witnesses under the pressure of cross-examination.

- Approximately one year ago, witnesses were shown a video clip of a distraction burglary at the University of Winchester during which two men entered the psychology department and entered a classroom under false pretences (pretending to be there to fix an electrical fault). While the lady inside the classroom went to find help, the men entered the classroom. Once inside the classroom, they stole a mobile phone, car keys, cash (notes), loose coins, a laptop, and sunglasses with a case.

- Witnesses were interviewed immediately after the event (to gather their initial evidence) and received an ABE interview 5-9 days later, including a number of identification lineups.

- Now, one year later, we would like you to challenge the witnesses on the testimony they gave.

- You will be the defense barrister representing the two men and you will be provided with their defence statement. Prior to the cross-examination, you will also be provided with the transcript of the witness's interview and this can be utilised in the same way as a witness statement / interview transcript would be in court.

- I, the researcher, will be present in the room with the participant during the cross-examination. The way the exercise is to work is that you will firstly ask a few pre-set questions to ensure that all participants are starting at the same point before the questioning phase. For this initial phase, please ask the following questions: *"Did you view the video approximately ten months ago? Were there three people in the video? None of whom you'd seen before? So, their appearance was not familiar to you before you watched the video? Aside from the identification lineups, so far as you're aware; you haven't seen any*

of them since? So, your only sight of the individuals was a three-minute video clip, approximately ten months ago? It is presumably difficult to recall such a short clip after all this time?"

- After these opening questions, you will challenge the witnesses on 6 topics relating to the evidence.

- Regarding the actual questioning on the 6 topics, this will be unlike a real life cross-examination. For each topic, you have THREE attempts to get the witness to cede to your challenge. In other words, to accept that they are wrong or not sure about their evidence on the point. Please stick to a maximum of THREE attempts per point. This procedure is so that we have a reliable way of measuring whether the witness ceded to the challenge, and at what point they did so (and to enable this to be comparable across witnesses). The actual questions you pose to the witness will be entirely your choice.

- At the end of the cross-examination, please read the following closing statement: *"Thank you for your time, you responded well to my questions. I asked you some difficult questions and you did well when answering these".*

Appendix W

Consent Forms (study 3)

Researcher Copy

THE UNIVERSITY OF WINCHESTER

Psychology Department

CONSENT FORM (**RESEARCHER** COPY)

Exploring cross-examination performance of adult witnesses

Gender *(please circle)* Male / Female

Age *(please state)* _____ years

I confirm that I have read and understood the participant information sheet from the earlier study which outlined that I would be asked some further questions approximately ten months later ☐

I have been informed of the purpose of taking part and the researcher has made clear to me any risks which may be involved in my participation in the project ☐

I understand that my participation is entirely voluntary and that I may withdraw from the study at any time up until 14 days after the study without penalty ☐

I understand the arrangements that have been made to ensure my anonymity and privacy, and that my data will remain anonymised ☐

I agree for my participation in the cross-examination to be audio recorded ☐

I agree for my participation in the cross-examination to be video recorded ☐

I agree for my audio and video recordings to be used in future research ☐

I consent to take part in this study ☐

Signed Participant: Date:

Signed Researcher: Date:

Please return this copy to the researcher

Participant Copy

THE UNIVERSITY OF WINCHESTER

Psychology Department

CONSENT FORM (**PARTICIPANT** COPY)

Exploring cross-examination performance of adult witnesses

Gender *(please circle)* Male / Female

Age *(please state)* _____ years

I confirm that I have read and understood the participant information sheet from the earlier study which outlined that I would be asked some further questions approximately ten months later ☐

I have been informed of the purpose of taking part and the researcher has made clear to me any risks which may be involved in my participation in the project ☐

I understand that my participation is entirely voluntary and that I may withdraw from the study at any time up until 14 days after the study without penalty ☐

I understand the arrangements that have been made to ensure my anonymity and privacy, and that my data will remain anonymised ☐

I agree for my participation in the cross-examination to be audio recorded ☐

I agree for my participation in the cross-examination to be video recorded ☐

I agree for my audio and video recordings to be used in future research ☐

I consent to take part in this study ☐

Signed Participant: Date:

Signed Researcher: Date:

Please keep this copy for your records

Appendix X

Debriefing Sheet (study 3)

THE UNIVERSITY OF WINCHESTER

Psychology Department

Participant Debriefing Sheet

Study Title: Exploring cross-examination performance of adult witnesses

Thank you very much for taking part in this study. The aim of the research was to investigate the cross-examination performance of typical adults (with no mental health problems) and adults with sub-clinical anxiety and depression, and sub-clinical anxiety, after being exposed to a mock staged crime in order to enhance our understanding of the accuracy of their memory at cross-examination. While previous research has explored the cross-examination performance of certain groups deemed vulnerable such as those with a learning disability (e.g., Kebbell, Hatton, Johnson & O'Kelly, 2001) and children (e.g., Zajac, Gross & Hayne, 2003), no research to date has looked at witness memory at cross-examination in individuals with a mental health problem. Based on the findings of previous literature demonstrating a relationship between mental health and deficits in cognition and memory (e.g., Austin, Mitchell & Goodwin, 2001; Tallis, Eysenck & Matthews, 1991) as well as research findings on impaired delayed memory recall in individuals with anxiety and depression (e.g., Butters et al., 2011; Ramponi, Murphy, Calder & Barnard, 2010), we expect to find that the cross-examination performance of individuals with a combination of anxiety and depression, or anxiety on its own, in this study will be significantly affected.

It is hoped that the information gained from this study will enable us to develop our understanding of the capabilities of eyewitnesses with sub-clinical anxiety and

depression, and sub-clinical anxiety, of recalling details about an event at cross-examination. Thank you once again for taking part in this study.

Appendix Y

Correlations between memory trace strength and cede performance (study 3)

Correlation between overall memory trace strength and overall cede performance

Correlations

		Overall_memory_trace_strength	Overall_cede_performance
Overall_memory_trace_strength	Pearson Correlation	1	-.412**
	Sig. (2-tailed)		.007
	N	42	42
Overall_cede_performance	Pearson Correlation	-.412**	1
	Sig. (2-tailed)	.007	
	N	42	42

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations between memory trace strength and cede performance for each topic

Correlations

		Topic_1_memory_trace_strength	Topic_2_memory_trace_strength	Topic_3_memory_trace_strength	Topic_4_memory_trace_strength	Topic_5_memory_trace_strength	Topic_6_memory_trace_strength	Topic_1_cede_performance	Topic_2_cede_performance	Topic_3_cede_performance	Topic_4_cede_performance	Topic_5_cede_performance	Topic_6_cede_performance
Topic_1_memory_trace_strength	Pearson Correlation	1	.120	.205	.062	.069	.170	.514**	-.056	.203	-.061	-.101	.162
	Sig. (2-tailed)		.448	.193	.699	.663	.282	.000	.725	.197	.702	.525	.305
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_2_memory_trace_strength	Pearson Correlation	.120	1	.109	.339*	.158	.180	-.064	.437**	-.081	.026	.113	.133
	Sig. (2-tailed)	.448		.492	.028	.316	.255	.688	.004	.612	.869	.477	.402
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_3_memory_trace_strength	Pearson Correlation	.205	.109	1	.071	-.176	.017	.144	.227	.659**	-.025	-.184	-.021
	Sig. (2-tailed)	.193	.492		.655	.265	.915	.364	.149	.000	.876	.244	.893
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_4_memory_trace_strength	Pearson Correlation	.062	.339*	.071	1	-.100	.157	.093	.235	.162	.539**	.106	.069
	Sig. (2-tailed)	.699	.028	.655		.528	.322	.559	.134	.306	.000	.504	.662
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_5_memory_trace_strength	Pearson Correlation	.069	.158	-.176	-.100	1	.172	.043	.205	-.216	-.109	.562**	-.090
	Sig. (2-tailed)	.663	.316	.265	.528		.275	.785	.193	.170	.491	.000	.570
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_6_memory_trace_strength	Pearson Correlation	.170	.180	.017	.157	.172	1	.231	.132	-.033	-.156	-.043	.560**
	Sig. (2-tailed)	.282	.255	.915	.322	.275		.141	.404	.837	.323	.789	.000
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_1_cede_performance	Pearson Correlation	.514**	-.064	.144	.093	.043	.231	1	-.055	.137	-.183	.170	-.063
	Sig. (2-tailed)	.000	.688	.364	.559	.785	.141		.730	.387	.246	.281	.691
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_2_cede_performance	Pearson Correlation	-.056	.437**	.227	.235	.205	.132	-.055	1	.015	.121	.149	.112
	Sig. (2-tailed)	.725	.004	.149	.134	.193	.404	.730		.926	.445	.348	.479
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_3_cede_performance	Pearson Correlation	.203	-.081	.659**	.162	-.216	-.033	.137	.015	1	.223	-.116	.033
	Sig. (2-tailed)	.197	.612	.000	.306	.170	.837	.387	.926		.155	.464	.837
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_4_cede_performance	Pearson Correlation	-.061	.026	-.025	.539**	-.109	-.156	-.183	.121	.223	1	-.047	-.048
	Sig. (2-tailed)	.702	.869	.876	.000	.491	.323	.246	.445	.155		.769	.762
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_5_cede_performance	Pearson Correlation	-.101	.113	-.184	.106	.562**	-.043	.170	.149	-.116	-.047	1	-.250
	Sig. (2-tailed)	.525	.477	.244	.504	.000	.789	.281	.348	.464	.769		.110
	N	42	42	42	42	42	42	42	42	42	42	42	42
Topic_6_cede_performance	Pearson Correlation	.162	.133	-.021	.069	-.090	.560**	-.063	.112	.033	-.048	-.250	1
	Sig. (2-tailed)	.305	.402	.893	.662	.570	.000	.691	.479	.837	.762	.110	
	N	42	42	42	42	42	42	42	42	42	42	42	42

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix Z

ANOVA: effect of condition on overall memory trace strength (study 3)

Descriptives

Overall_memory_trace_strength

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
						Lower Bound	Upper Bound			
Typical		13	9.08	2.929	.812	7.31	10.85	5	15	
Anxiety and Depression		15	9.00	2.070	.535	7.85	10.15	5	13	
Anxiety		14	7.36	2.845	.760	5.71	9.00	4	14	
Total		42	8.48	2.680	.414	7.64	9.31	4	15	
Model	Fixed Effects			2.622	.405	7.66	9.29			
	Random Effects				.561	6.06	10.89			.450

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Overall_memory_trace_strength	Based on Mean	.861	2	39	.431
	Based on Median	.741	2	39	.483
	Based on Median and with adjusted df	.741	2	35.924	.484
	Based on trimmed mean	.798	2	39	.457

ANOVA

Overall_memory_trace_strength

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.339	2	13.169	1.915	.161
Within Groups	268.137	39	6.875		
Total	294.476	41			

Appendix AA

ANCOVA: effect of condition on overall cede performance with overall memory trace strength as a covariate (study 3)

Descriptive Statistics

Dependent Variable: Overall_cede_performance

Condition	Mean	Std. Deviation	N
Typical	4.15	1.068	13
Anxiety and Depression	3.80	.862	15
Anxiety	4.14	1.460	14
Total	4.02	1.137	42

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Overall_cede_performanc

F	df1	df2	Sig.
1.540	2	39	.227

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Overall_memory_trace_strength + Condition

Parameter Estimates

Dependent Variable: Overall_cede_performance

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	5.484	.555	9.872	.000	4.359	6.608	.719
Overall_memory_trace_strength	-.182	.065	-2.809	.008	-.314	-.051	.172
[Condition=1]	.324	.424	.765	.449	-.534	1.183	.015
[Condition=2]	-.043	.409	-.106	.916	-.871	.784	.000
[Condition=3]	0[a]	.	.	.	.	.	.

a. This parameter is set to zero because it is redundant.

Tests of Between-Subjects Effects

Dependent Variable: Overall_cede_performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	10.076[a]	3	3.359	2.975	.044	.190
Intercept	106.548	1	106.548	94.378	.000	.713
Overall_memory_trace_strength	8.906	1	8.906	7.889	.008	.172
Condition	1.077	2	.539	.477	.624	.025
Error	42.900	38	1.129			
Total	733.000	42				
Corrected Total	52.976	41				

a. R Squared = .190 (Adjusted R Squared = .126)

Appendix BB

Questionnaire (study 4)

THE UNIVERSITY OF WINCHESTER

Questionnaire

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

To take part in this research study, you must be eligible for jury service in the UK. To be eligible for jury service, you must meet the criteria listed below.

Eligibility for jury service:

You could be selected to serve on a jury in the UK if you:

- Are aged between 18 and 75 years;
- Are registered on your local government's electoral register;
- Have lived in the UK, the Channel Isles or the Isle of Man for the last five years since you were 13 years old.

You are disqualified from jury service if:

- You lack the mental capacity to do so. Mental capacity is the ability to make a decision for yourself. People who cannot do this are said to 'lack capacity' under the Mental Capacity Act 2005. This must be due to an impairment of or disturbance in the functioning of the mind or brain which may be due to illness, injury, learning disability, or mental health problems.
- To have capacity, a person must be able to:
    - Understand the information that is relevant to the decision they want to make;
    - Retain the information long enough to be able to make the decision;
    - Weigh up the information available to make the decision;
    - Communicate the decision by any means.

You are disqualified from jury service if you are currently on bail in criminal proceedings. You are also disqualified if:

- you have ever been sentenced to imprisonment for five years or more;
- you have been imprisoned at all in the last 10 years.

Do you meet the criteria for serving on a jury (please circle)?

Yes No

Now we would like to ask some more questions about you…

What is your age?

____ years

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other (please specify):

What is your ethnicity?

- ☐ White British
- ☐ White Irish
- ☐ Any other White background
- ☐ Black or Black British
- ☐ Black Caribbean
- ☐ Black African
- ☐ Asian Indian
- ☐ Asian Pakistani
- ☐ Asian Bangladeshi
- ☐ Any other Asian background
- ☐ Mixed White and Black Caribbean
- ☐ Mixed White and Black African

- ☐ Any other Black background
- ☐ Chinese
- ☐ Asian or Asian British
- ☐ Mixed White and Asian
- ☐ Any other Mixed background
- ☐ Any other Ethnic group

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF A WITNESS BEING INTERVIEWED ABOUT AN EVENT THEY HAVE SEEN.

THE WITNESS HAS <u>ANXIETY AND DEPRESSION.</u>

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how **convincing** the witness was in their account:

Not at all convincing						Extremely convincing
1	2	3	4	5	6	7

3) Please circle the number that you feel best represents how **confident** the witness appeared **in what they said** in their account:

Not at all confident						Extremely confident
1	2	3	4	5	6	7

4) Please circle the number that you feel best represents how **confident** the witness appeared in general **in their demeanour:**

Not at all confident						Extremely confident
1	2	3	4	5	6	7

5) Please circle the number that you feel best represents how **competent** the witness appeared in their account:

Not at all competent						Extremely competent
1	2	3	4	5	6	7

6) Please circle the number that you feel best represents how **honest** the witness appeared:

Not at all honest						Extremely honest
1	2	3	4	5	6	7

7) Please circle the number that you feel best represents how **believable** the witness appeared:

Not at all believable						Extremely believable
1	2	3	4	5	6	7

8) Please circle the number that you feel best represents how **complete** the witness's account appeared:

Not at all complete						Very complete
1	2	3	4	5	6	7

9) Please circle the number that you feel best represents the witness's overall **level of cognitive functioning** (i.e., their ability to think, reason and remember):

Very poor cognitive functioning						Excellent cognitive functioning
1	2	3	4	5	6	7

10) Please circle the number that you feel best represents the witness's **capability to testify:**

Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

_____

_____

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF THE SAME WITNESS BEING CROSS-EXAMINED BY A BARRISTER.

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how **convincing** the witness was in their account:

Not at all convincing						Extremely convincing
1	2	3	4	5	6	7

3) Please circle the number that you feel best represents how **confident** the witness appeared **in what they said** in their account:

Not at all confident						Extremely confident
1	2	3	4	5	6	7

4) Please circle the number that you feel best represents how **confident** the witness appeared in general **in their demeanour:**

Not at all confident						Extremely confident
1	2	3	4	5	6	7

5) Please circle the number that you feel best represents how **competent** the witness appeared in their account:

Not at all competent						Extremely competent
1	2	3	4	5	6	7

6) Please circle the number that you feel best represents how **honest** the witness appeared:

Not at all honest						Extremely honest
1	2	3	4	5	6	7

7) Please circle the number that you feel best represents how **believable** the witness appeared:

Not at all believable						Extremely believable
1	2	3	4	5	6	7

8) Please circle the number that you feel best represents how **complete** the witness's account appeared:

Not at all complete						Very complete
1	2	3	4	5	6	7

9) Please circle the number that you feel best represents the witness's overall **level of cognitive functioning** (i.e., their ability to think, reason and remember):

Very poor cognitive functioning						Excellent cognitive functioning
1	2	3	4	5	6	7

10) Please circle the number that you feel best represents the witness's **capability to testify:**

Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

FINAL QUESTIONS:

1) Please circle the number that you feel best represents how credible this person was as a witness during the **first video** (interview):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how credible this person was as a witness during the **second video** (cross-examination):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

3) Taking everything into account, please circle the number that you feel best represents how credible this person was as a witness **OVERALL** (taking into account both videos):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

4) If all other evidence is equal; on the basis of this witness testimony, do you think the defendants are guilty or not guilty?

Guilty Not guilty

Do you remember that the witness has anxiety and depression?

Yes No

THE UNIVERSITY OF WINCHESTER

Questionnaire

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

To take part in this research study, you must be eligible for jury service in the UK. To be eligible for jury service, you must meet the criteria listed below.

Eligibility for jury service:

You could be selected to serve on a jury in the UK if you:

- Are aged between 18 and 75 years;
- Are registered on your local government's electoral register;
- Have lived in the UK, the Channel Isles or the Isle of Man for the last five years since you were 13 years old.

You are disqualified from jury service if:

- You lack the mental capacity to do so. Mental capacity is the ability to make a decision for yourself. People who cannot do this are said to 'lack capacity' under the Mental Capacity Act 2005. This must be due to an impairment of or disturbance in the functioning of the mind or brain which may be due to illness, injury, learning disability, or mental health problems.
- To have capacity, a person must be able to:
    - Understand the information that is relevant to the decision they want to make;
    - Retain the information long enough to be able to make the decision;
    - Weigh up the information available to make the decision;
    - Communicate the decision by any means.

You are disqualified from jury service if you are currently on bail in criminal proceedings. You are also disqualified if:

- you have ever been sentenced to imprisonment for five years or more;
- you have been imprisoned at all in the last 10 years.

Do you meet the criteria for serving on a jury (please circle)?

Yes No

Now we would like to ask some more questions about you…

What is your age?

____ years

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other (please specify):

What is your ethnicity?

- ☐ White British
- ☐ White Irish
- ☐ Any other White background
- ☐ Black or Black British
- ☐ Black Caribbean
- ☐ Black African
- ☐ Any other Black background
- ☐ Chinese
- ☐ Asian Indian
- ☐ Asian Pakistani
- ☐ Asian Bangladeshi
- ☐ Any other Asian background
- ☐ Mixed White and Black Caribbean
- ☐ Mixed White and Black African
- ☐ Mixed White and Asian
- ☐ Any other Mixed background

☐ Asian or Asian British ☐ Any other Ethnic group

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF A WITNESS BEING INTERVIEWED ABOUT AN EVENT THEY HAVE SEEN.

THE WITNESS HAS <u>ANXIETY.</u>

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how **convincing** the witness was in their account:

Not at all convincing						Extremely convincing
1	2	3	4	5	6	7

3) Please circle the number that you feel best represents how **confident** the witness appeared **in what they said** in their account:

Not at all confident						Extremely confident
1	2	3	4	5	6	7

4) Please circle the number that you feel best represents how **confident** the witness appeared in general **in their demeanour:**

Not at all confident						Extremely confident
1	2	3	4	5	6	7

5) Please circle the number that you feel best represents how **competent** the witness appeared in their account:

Not at all competent						Extremely competent
1	2	3	4	5	6	7

6) Please circle the number that you feel best represents how **honest** the witness appeared:

Not at all honest						Extremely honest
1	2	3	4	5	6	7

7) Please circle the number that you feel best represents how **believable** the witness appeared:

Not at all believable						Extremely believable
1	2	3	4	5	6	7

8) Please circle the number that you feel best represents how **complete** the witness's account appeared:

Not at all complete						Very complete
1	2	3	4	5	6	7

9) Please circle the number that you feel best represents the witness's overall **level of cognitive functioning** (i.e., their ability to think, reason and remember):

Very poor cognitive functioning						Excellent cognitive functioning
1	2	3	4	5	6	7

10) Please circle the number that you feel best represents the witness's **capability to testify:**

Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

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_____

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF THE SAME WITNESS BEING CROSS-EXAMINED BY A BARRISTER.

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how **convincing** the witness was in their account:

Not at all convincing						Extremely convincing
1	2	3	4	5	6	7

3) Please circle the number that you feel best represents how **confident** the witness appeared **in what they said** in their account:

Not at all confident						Extremely confident
1	2	3	4	5	6	7

4) Please circle the number that you feel best represents how **confident** the witness appeared in general **in their demeanour:**

Not at all confident						Extremely confident
1	2	3	4	5	6	7

5) Please circle the number that you feel best represents how **competent** the witness appeared in their account:

Not at all competent						Extremely competent
1	2	3	4	5	6	7

6) Please circle the number that you feel best represents how **honest** the witness appeared:

Not at all honest						Extremely honest
1	2	3	4	5	6	7

7) Please circle the number that you feel best represents how **believable** the witness appeared:

Not at all believable						Extremely believable
1	2	3	4	5	6	7

8) Please circle the number that you feel best represents how **complete** the witness's account appeared:

Not at all complete						Very complete
1	2	3	4	5	6	7

9) Please circle the number that you feel best represents the witness's overall **level of cognitive functioning** (i.e., their ability to think, reason and remember):

Very poor cognitive functioning						Excellent cognitive functioning
1	2	3	4	5	6	7

10) Please circle the number that you feel best represents the witness's **capability to testify:**

Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

FINAL QUESTIONS:

1) Please circle the number that you feel best represents how credible this person was as a witness during the **first video** (interview):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how credible this person was as a witness during the **second video** (cross-examination):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

3) Taking everything into account, please circle the number that you feel best represents how credible this person was as a witness **OVERALL** (taking into account both videos):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

4) If all other evidence is equal; on the basis of this witness testimony, do you think the defendants are guilty or not guilty?

Guilty Not guilty

Do you remember that the witness has anxiety?

Yes No

THE UNIVERSITY OF WINCHESTER

Questionnaire

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

To take part in this research study, you must be eligible for jury service in the UK. To be eligible for jury service, you must meet the criteria listed below.

Eligibility for jury service:

You could be selected to serve on a jury in the UK if you:

- Are aged between 18 and 75 years;
- Are registered on your local government's electoral register;
- Have lived in the UK, the Channel Isles or the Isle of Man for the last five years since you were 13 years old.

You are disqualified from jury service if:

- You lack the mental capacity to do so. Mental capacity is the ability to make a decision for yourself. People who cannot do this are said to 'lack capacity' under the Mental Capacity Act 2005. This must be due to an impairment of or disturbance in the functioning of the mind or brain which may be due to illness, injury, learning disability, or mental health problems.
- To have capacity, a person must be able to:
    - Understand the information that is relevant to the decision they want to make;
    - Retain the information long enough to be able to make the decision;
    - Weigh up the information available to make the decision;
    - Communicate the decision by any means.

You are disqualified from jury service if you are currently on bail in criminal proceedings. You are also disqualified if:

- you have ever been sentenced to imprisonment for five years or more;
- you have been imprisoned at all in the last 10 years.

Do you meet the criteria for serving on a jury (please circle)?

Yes No

Now we would like to ask some more questions about you…

What is your age?

____ years

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other (please specify):

What is your ethnicity?

- ☐ White British
- ☐ White Irish
- ☐ Any other White background
- ☐ Black or Black British
- ☐ Black Caribbean
- ☐ Black African
- ☐ Any other Black background
- ☐ Chinese
- ☐ Asian Indian
- ☐ Asian Pakistani
- ☐ Asian Bangladeshi
- ☐ Any other Asian background
- ☐ Mixed White and Black Caribbean
- ☐ Mixed White and Black African
- ☐ Mixed White and Asian
- ☐ Any other Mixed background

☐ Asian or Asian British ☐ Any other Ethnic group

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF A WITNESS BEING INTERVIEWED ABOUT AN EVENT THEY HAVE SEEN.

THE WITNESS DOES <u>NOT</u> HAVE A MENTAL HEALTH PROBLEM.

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how **convincing** the witness was in their account:

Not at all convincing						Extremely convincing
1	2	3	4	5	6	7

3) Please circle the number that you feel best represents how **confident** the witness appeared **in what they said** in their account:

Not at all confident						Extremely confident
1	2	3	4	5	6	7

4) Please circle the number that you feel best represents how **confident** the witness appeared in general **in their demeanour:**

Not at all confident						Extremely confident
1	2	3	4	5	6	7

5) Please circle the number that you feel best represents how **competent** the witness appeared in their account:

Not at all competent						Extremely competent
1	2	3	4	5	6	7

6) Please circle the number that you feel best represents how **honest** the witness appeared:

Not at all honest						Extremely honest
1	2	3	4	5	6	7

7) Please circle the number that you feel best represents how **believable** the witness appeared:

Not at all believable						Extremely believable
1	2	3	4	5	6	7

8) Please circle the number that you feel best represents how **complete** the witness's account appeared:

Not at all complete						Very complete
1	2	3	4	5	6	7

9) Please circle the number that you feel best represents the witness's overall **level of cognitive functioning** (i.e., their ability to think, reason and remember):

Very poor cognitive functioning						Excellent cognitive functioning
1	2	3	4	5	6	7

10) Please circle the number that you feel best represents the witness's **capability to testify:**

Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

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_____

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF THE SAME WITNESS BEING CROSS-EXAMINED BY A BARRISTER.

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

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Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

FINAL QUESTIONS:

1) Please circle the number that you feel best represents how credible this person was as a witness during the **first video** (interview):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how credible this person was as a witness during the **second video** (cross-examination):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

3) Taking everything into account, please circle the number that you feel best represents how credible this person was as a witness **OVERALL** (taking into account both videos):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

4) If all other evidence is equal; on the basis of this witness testimony, do you think the defendants are guilty or not guilty?

Guilty Not guilty

THE UNIVERSITY OF WINCHESTER

Questionnaire

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

To take part in this research study, you must be eligible for jury service in the UK. To be eligible for jury service, you must meet the criteria listed below.

Eligibility for jury service:

You could be selected to serve on a jury in the UK if you:

- Are aged between 18 and 75 years;
- Are registered on your local government's electoral register;
- Have lived in the UK, the Channel Isles or the Isle of Man for the last five years since you were 13 years old.

You are disqualified from jury service if:

- You lack the mental capacity to do so. Mental capacity is the ability to make a decision for yourself. People who cannot do this are said to 'lack capacity' under the Mental Capacity Act 2005. This must be due to an impairment of or disturbance in the functioning of the mind or brain which may be due to illness, injury, learning disability, or mental health problems.
- To have capacity, a person must be able to:
    - Understand the information that is relevant to the decision they want to make;
    - Retain the information long enough to be able to make the decision;
    - Weigh up the information available to make the decision;
    - Communicate the decision by any means.

You are disqualified from jury service if you are currently on bail in criminal proceedings. You are also disqualified if:

- you have ever been sentenced to imprisonment for five years or more;
- you have been imprisoned at all in the last 10 years.

Do you meet the criteria for serving on a jury (please circle)?

Yes No

Now we would like to ask some more questions about you…

What is your age?

____ years

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Other (please specify):

What is your ethnicity?

- ☐ White British
- ☐ White Irish
- ☐ Any other White background
- ☐ Black or Black British
- ☐ Black Caribbean
- ☐ Black African
- ☐ Any other Black background
- ☐ Chinese
- ☐ Asian Indian
- ☐ Asian Pakistani
- ☐ Asian Bangladeshi
- ☐ Any other Asian background
- ☐ Mixed White and Black Caribbean
- ☐ Mixed White and Black African
- ☐ Mixed White and Asian
- ☐ Any other Mixed background

☐ Asian or Asian British ☐ Any other Ethnic group

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF A WITNESS BEING INTERVIEWED ABOUT AN EVENT THEY HAVE SEEN.

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how **convincing** the witness was in their account:

Not at all convincing						Extremely convincing
1	2	3	4	5	6	7

3) Please circle the number that you feel best represents how **confident** the witness appeared **in what they said** in their account:

Not at all confident						Extremely confident
1	2	3	4	5	6	7

4) Please circle the number that you feel best represents how **confident** the witness appeared in general **in their demeanour:**

Not at all confident						Extremely confident
1	2	3	4	5	6	7

5) Please circle the number that you feel best represents how **competent** the witness appeared in their account:

Not at all competent						Extremely competent
1	2	3	4	5	6	7

6) Please circle the number that you feel best represents how **honest** the witness appeared:

Not at all honest						Extremely honest
1	2	3	4	5	6	7

7) Please circle the number that you feel best represents how **believable** the witness appeared:

Not at all believable						Extremely believable
1	2	3	4	5	6	7

8) Please circle the number that you feel best represents how **complete** the witness's account appeared:

Not at all complete						Very complete
1	2	3	4	5	6	7

9) Please circle the number that you feel best represents the witness's overall **level of cognitive functioning** (i.e., their ability to think, reason and remember):

Very poor cognitive functioning						Excellent cognitive functioning
1	2	3	4	5	6	7

10) Please circle the number that you feel best represents the witness's **capability to testify:**

Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

_____

_____

NOW WE WOULD LIKE YOU TO WATCH A SHORT VIDEO CLIP OF THE SAME WITNESS BEING CROSS-EXAMINED BY A BARRISTER.

ONCE YOU HAVE WATCHED THE VIDEO, PLEASE ANSWER THE FOLLOWING QUESTIONS:

1) Please circle the number that you feel best represents how **accurate** the witness's account was:

Not at all accurate						Extremely accurate
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how **convincing** the witness was in their account:

Not at all convincing						Extremely convincing
1	2	3	4	5	6	7

3) Please circle the number that you feel best represents how **confident** the witness appeared **in what they said** in their account:

Not at all confident						Extremely confident
1	2	3	4	5	6	7

4) Please circle the number that you feel best represents how **confident** the witness appeared in general **in their demeanour:**

Not at all confident						Extremely confident
1	2	3	4	5	6	7

5) Please circle the number that you feel best represents how **competent** the witness appeared in their account:

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6) Please circle the number that you feel best represents how **honest** the witness appeared:

Not at all honest						Extremely honest
1	2	3	4	5	6	7

7) Please circle the number that you feel best represents how **believable** the witness appeared:

Not at all believable						Extremely believable
1	2	3	4	5	6	7

8) Please circle the number that you feel best represents how **complete** the witness's account appeared:

Not at all complete						Very complete
1	2	3	4	5	6	7

9) Please circle the number that you feel best represents the witness's overall **level of cognitive functioning** (i.e., their ability to think, reason and remember):

Very poor cognitive functioning						Excellent cognitive functioning
1	2	3	4	5	6	7

10) Please circle the number that you feel best represents the witness's **capability to testify:**

Very poor capability to testify						Excellent capability to testify
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

FINAL QUESTIONS:

1) Please circle the number that you feel best represents how credible this person was as a witness during the **first video** (interview):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

2) Please circle the number that you feel best represents how credible this person was as a witness during the **second video** (cross-examination):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

3) Taking everything into account, please circle the number that you feel best represents how credible this person was as a witness **OVERALL** (taking into account both videos):

Not at all credible						Extremely credible
1	2	3	4	5	6	7

OPTIONAL: If you wish, please let us know how you think the witness's **credibility** might be improved (please describe briefly and PLEASE WRITE CLEARLY):

_____

_____

_____

_____

4) If all other evidence is equal; on the basis of this witness testimony, do you think the defendants are guilty or not guilty?

Guilty Not guilty

Appendix CC

Participant Information Sheet (study 4)

THE UNIVERSITY OF WINCHESTER

Psychology Department

Participant Information Sheet

Researcher: Beth Parsons

Email: B.Parsons1.15@unimail.winchester.ac.uk

Supervisor: Dr Rachel Wilcock

Email: Rachel.Wilcock@winchester.ac.uk

Tel: 01962 624855 ext 4855

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

Ethics number: HSSE16046

You are being invited to take part in a research study. To help you decide whether or not to take part, please read the following information about why the research is being done.

What is the purpose of this study?

The purpose of this study is to gain further insight into how mock jurors perceive adult eyewitnesses in order to enhance the knowledge and understanding of the perceptions of jury members in a court of law.

Who is eligible to take part in this study?

Both males and females between the ages of 18 and 75 years who are jury eligible are being invited to take part. If you are a student at the University of Winchester, you will take part in the study in a quiet room on the university premises. If you are a member of the local community, you will take part in the study in a quiet, convenient location.

What will happen to me if I take part?

If you decide to take part, you will be asked to give informed consent. Once you have consented, you will view two video clips: one of an interview and one of a cross-examination provided by a witness, and be asked some questions about the accuracy and reliability of their evidence.

Do I have to take part?

It is your decision whether or not to take part. If you do decide to take part, you will be asked to provide your consent. You are still free to withdraw within 14 days of taking part and without giving a reason, if you decide to participate.

What are the possible benefits and risks of taking part?

Your participation in this study will require you to view a video interview and a video cross-examination provided by a witness to a mild mock crime event and answer some simple questions so there are no risks to you if you agree to participate. Whilst there are no direct benefits to you from taking part, it is hoped that the information gained from this study will enable us to further understand jurors' perceptions of adult eyewitnesses.

Will my participation be kept confidential?

It will be ensured that no names are attached to the data and the data will be securely stored on the computer to which only the researcher has access. Participant details will be coded and no identifiable personal information will be stored on the computer.

What should I do if I wish to take part?

If you wish to take part in this study, you will be asked to provide your consent.

What happens if I change my mind?

Your participation in this study is completely voluntary. You may withdraw within 14 days of taking part should you wish to do so without any consequences.

What will happen to the results of this research study?

The results of this study are primarily for a PhD. It is hoped that the results will also be published in suitable professional journals. It will not be possible to identify any individuals from any of the data presented.

Who has reviewed this study?

This study has been approved by the University of Winchester Faculty of Humanities and Social Sciences RKE Ethics Committee. If you have any concerns about the way in which the study has been conducted, you can contact the University of Winchester Chair of RKE Ethics Committee, Dr Maru Mormina: Maru.Mormina@winchester.ac.uk

Contact for Further Information

For further information, please contact me or my supervisor; our contact details can be found above.

Thank you for taking the time to read this information

Appendix DD

Consent Forms (study 4)

THE UNIVERSITY OF WINCHESTER

Psychology Department

CONSENT FORM (**RESEARCHER** COPY)

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

Gender *(please circle)* Male / Female

Age *(please state)* _____ years

I confirm that I have read and understood the participant information sheet about this study ☐

I have been informed of the purpose of taking part and the researcher has made clear to me any risks which may be involved in my participation in the project ☐

I understand that my participation is entirely voluntary and that I may withdraw from the study at any time up until 14 days after I have completed the questionnaire ☐

I understand the arrangements that have been made to ensure my anonymity

and privacy, and that my data will remain anonymised ☐

I consent to take part in this study ☐

Signed Participant: Date:

Signed Researcher: Date:

Please return this copy to the researcher

THE UNIVERSITY OF WINCHESTER

Psychology Department

CONSENT FORM (**PARTICIPANT** COPY)

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

Gender *(please circle)* Male / Female

Age *(please state)* _____ years

I confirm that I have read and understood the participant information sheet about this study ☐

I have been informed of the purpose of taking part and the researcher has made clear to me any risks which may be involved in my participation in the project ☐

I understand that my participation is entirely voluntary and that I may withdraw from the study at any time up until 14 days after I have completed the questionnaire ☐

I understand the arrangements that have been made to ensure my anonymity and privacy, and that my data will remain anonymised ☐

I consent to take part in this study ☐

Signed Participant: Date:

Signed Researcher: Date:

Please keep this copy for your records

Appendix EE

Debriefing Sheet (study 4)

THE UNIVERSITY OF WINCHESTER

Psychology Department

Participant Debriefing Sheet

Study Title: Exploring mock jurors' perceptions of adult eyewitnesses

Thank you very much for taking part in this study. The aim of the research was to explore mock jurors' perceptions of the accuracy and reliability of witnesses with a mental health problem and typical witnesses with no mental health problems in order to enhance our understanding of how such witnesses are regarded by jurors during the criminal justice process.

Whilst there has been some effort within the literature to explore juror perceptions of vulnerability, the literature base is limited. To our knowledge, there has been no research to date that has looked at juror perceptions of witnesses with a mental health problem. Based on previous findings suggesting that jurors perceive the evidence of vulnerable witnesses to be less reliable than the evidence of typical witnesses (e.g., Allison, Brimacombe, Hunter & Kadlec, 2006; Henry, Ridley, Perry & Crane, 2011; Peled, Iarocci & Connolly, 2004), we expect to find that jurors will perceive witnesses with a mental health problem to be less credible than their typical counterparts. It is hoped that the information gained from this study will enable us to develop our understanding of juror perceptions regarding witnesses with sub-clinical anxiety and depression, and sub-clinical anxiety.

Thank you once again for taking part in this study. If you would like further information about the study, please do not hesitate to contact me or my supervisor (contact details can be found on the participant information sheet).

References

Allison, M., Brimacombe, C. A., Hunter, M. A., & Kadlec, H. (2006). Young and Older Adult Eyewitnesses' Use of Narrative Features in Testimony. *Discourse Processes, 41,* 289-314.

Henry, L., Ridley, A., Perry, J., & Crane, L. (2011). Perceived Credibility and Eyewitness Testimony of Children With Intellectual Disabilities. *Journal of Intellectual Disability Research, 55,* 385-391.

Peled, M., Iarocci, G., & Connolly, D. A. (2004). Eyewitness Testimony and Perceived Credibility of Youth With Mild Intellectual Disability. *Journal of Intellectual Disability Research, 48,* 699-703.

Appendix FF

MANOVAs (study 4)

MANOVA (effect of mental health status and knowledge on mock jurors' perceptions of the witness at interview)

Descriptive Statistics

	MH_status_of_witness	Informed_uninformed	Mean	Std. Deviation	N
Interview_accurate	Typical	Informed	5.20	1.105	20
		Uninformed	4.90	.852	20
		Total	5.05	.986	40
	Anxiety & Depression	Informed	4.25	1.020	20
		Uninformed	4.10	.788	20
		Total	4.17	.903	40
	Anxiety only	Informed	5.10	1.210	20
		Uninformed	4.85	.988	20
		Total	4.98	1.097	40
	Total	Informed	4.85	1.176	60
		Uninformed	4.62	.940	60
		Total	4.73	1.067	120
Interview_convincing	Typical	Informed	4.90	.852	20
		Uninformed	4.95	1.356	20
		Total	4.93	1.118	40
	Anxiety & Depression	Informed	3.80	1.609	20
		Uninformed	3.80	1.240	20
		Total	3.80	1.418	40
	Anxiety only	Informed	4.75	1.333	20
		Uninformed	4.40	1.142	20
		Total	4.58	1.238	40
	Total	Informed	4.48	1.372	60
		Uninformed	4.38	1.316	60
		Total	4.43	1.339	120
Interview_confident_account	Typical	Informed	4.60	1.142	20
		Uninformed	5.00	1.170	20
		Total	4.80	1.159	40
	Anxiety & Depression	Informed	3.50	1.192	20
		Uninformed	3.45	1.538	20
		Total	3.48	1.358	40
	Anxiety only	Informed	4.60	.995	20
		Uninformed	4.50	.827	20
		Total	4.55	.904	40
	Total	Informed	4.23	1.212	60
		Uninformed	4.32	1.359	60
		Total	4.28	1.283	120
Interview_confident_general	Typical	Informed	4.15	1.531	20
		Uninformed	4.00	1.589	20
		Total	4.07	1.542	40
	Anxiety & Depression	Informed	3.20	1.240	20
		Uninformed	3.15	1.496	20
		Total	3.18	1.357	40
	Anxiety only	Informed	3.70	1.380	20
		Uninformed	3.90	1.165	20
		Total	3.80	1.265	40
	Total	Informed	3.68	1.420	60
		Uninformed	3.68	1.455	60
		Total	3.68	1.432	120
Interview_competent	Typical	Informed	4.90	.968	20
		Uninformed	4.80	1.240	20
		Total	4.85	1.099	40
	Anxiety & Depression	Informed	3.80	1.196	20
		Uninformed	4.05	1.146	20
		Total	3.92	1.163	40
	Anxiety only	Informed	4.75	1.164	20
		Uninformed	4.45	1.146	20
		Total	4.60	1.150	40
	Total	Informed	4.48	1.200	60
		Uninformed	4.43	1.198	60
		Total	4.46	1.194	120
Interview_honest	Typical	Informed	6.05	.999	20
		Uninformed	5.95	.999	20
		Total	6.00	.987	40
	Anxiety & Depression	Informed	5.40	1.231	20
		Uninformed	5.35	.813	20
		Total	5.38	1.030	40
	Anxiety only	Informed	5.65	1.424	20
		Uninformed	5.85	.875	20
		Total	5.75	1.171	40
	Total	Informed	5.70	1.239	60
		Uninformed	5.72	.922	60
		Total	5.71	1.088	120

Interview_believable	Typical	Informed	5.50	1.100	20
		Uninformed	5.50	1.147	20
		Total	5.50	1.109	40
	Anxiety & Depression	Informed	4.25	1.682	20
		Uninformed	4.45	1.050	20
		Total	4.35	1.388	40
	Anxiety only	Informed	5.40	1.095	20
		Uninformed	5.50	.827	20
		Total	5.45	.959	40
	Total	Informed	5.05	1.419	60
		Uninformed	5.15	1.117	60
		Total	5.10	1.273	120
Interview_complete	Typical	Informed	4.40	1.353	20
		Uninformed	4.30	1.380	20
		Total	4.35	1.350	40
	Anxiety & Depression	Informed	3.60	1.314	20
		Uninformed	3.40	1.231	20
		Total	3.50	1.261	40
	Anxiety only	Informed	4.50	1.318	20
		Uninformed	4.05	1.099	20
		Total	4.27	1.219	40
	Total	Informed	4.17	1.368	60
		Uninformed	3.92	1.279	60
		Total	4.04	1.325	120
Interview_cognitive_functioning	Typical	Informed	5.35	1.137	20
		Uninformed	5.05	1.432	20
		Total	5.20	1.285	40
	Anxiety & Depression	Informed	3.75	1.333	20
		Uninformed	4.55	1.701	20
		Total	4.15	1.562	40
	Anxiety only	Informed	5.15	.933	20
		Uninformed	4.80	1.196	20
		Total	4.98	1.074	40
	Total	Informed	4.75	1.336	60
		Uninformed	4.80	1.447	60
		Total	4.78	1.387	120
Interview_capability_to_testify	Typical	Informed	5.30	1.261	20
		Uninformed	4.75	1.517	20
		Total	5.02	1.405	40
	Anxiety & Depression	Informed	4.25	1.164	20
		Uninformed	4.20	1.735	20
		Total	4.23	1.459	40
	Anxiety only	Informed	5.00	.973	20
		Uninformed	4.80	1.152	20
		Total	4.90	1.057	40
	Total	Informed	4.85	1.205	60
		Uninformed	4.58	1.488	60
		Total	4.72	1.355	120
Credibility_Interview	Typical	Informed	5.00	1.214	20
		Uninformed	5.10	1.119	20
		Total	5.05	1.154	40
	Anxiety & Depression	Informed	3.90	1.373	20
		Uninformed	4.20	1.196	20
		Total	4.05	1.280	40
	Anxiety only	Informed	4.95	.999	20
		Uninformed	5.00	.795	20
		Total	4.98	.891	40
	Total	Informed	4.62	1.290	60
		Uninformed	4.77	1.110	60
		Total	4.69	1.201	120

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.974	357.457[b]	11.000	104.000	.000	.974
	Wilks' Lambda	.026	357.457[b]	11.000	104.000	.000	.974
	Hotelling's Trace	37.808	357.457[b]	11.000	104.000	.000	.974
	Roy's Largest Root	37.808	357.457[b]	11.000	104.000	.000	.974
MH_status_of_witness	Pillai's Trace	.331	1.892	22.000	210.000	.012	.165
	Wilks' Lambda	.684	1.980[b]	22.000	208.000	.007	.173
	Hotelling's Trace	.441	2.067	22.000	206.000	.005	.181
	Roy's Largest Root	.386	3.687[c]	11.000	105.000	.000	.279
Informed_uninformed	Pillai's Trace	.117	1.249[b]	11.000	104.000	.265	.117
	Wilks' Lambda	.883	1.249[b]	11.000	104.000	.265	.117
	Hotelling's Trace	.132	1.249[b]	11.000	104.000	.265	.117
	Roy's Largest Root	.132	1.249[b]	11.000	104.000	.265	.117
MH_status_of_witness * Informed_uninformed	Pillai's Trace	.186	.976	22.000	210.000	.496	.093
	Wilks' Lambda	.823	.968[b]	22.000	208.000	.507	.093
	Hotelling's Trace	.205	.959	22.000	206.000	.518	.093
	Roy's Largest Root	.117	1.113[c]	11.000	105.000	.359	.104

a. Design: Intercept + MH_status_of_witness + Informed_uninformed + MH_status_of_witness * Informed_uninformed

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
Interview_accurate	Based on Mean	.818	5	114	.539
	Based on Median	.854	5	114	.514
	Based on Median and with adjusted df	.854	5	106.370	.515
	Based on trimmed mean	.879	5	114	.498
Interview_convincing	Based on Mean	2.025	5	114	.080
	Based on Median	1.449	5	114	.212
	Based on Median and with adjusted df	1.449	5	104.835	.213
	Based on trimmed mean	1.838	5	114	.111
Interview_confident_account	Based on Mean	2.310	5	114	.049
	Based on Median	1.588	5	114	.169
	Based on Median and with adjusted df	1.588	5	104.558	.170
	Based on trimmed mean	2.327	5	114	.047
Interview_confident_general	Based on Mean	.743	5	114	.593
	Based on Median	.732	5	114	.601
	Based on Median and with adjusted df	.732	5	110.613	.601
	Based on trimmed mean	.746	5	114	.590
Interview_competent	Based on Mean	.296	5	114	.914
	Based on Median	.173	5	114	.972
	Based on Median and with adjusted df	.173	5	110.547	.972
	Based on trimmed mean	.252	5	114	.938
Interview_honest	Based on Mean	1.353	5	114	.248
	Based on Median	1.277	5	114	.279
	Based on Median and with adjusted df	1.277	5	96.560	.280
	Based on trimmed mean	1.180	5	114	.323
Interview_believable	Based on Mean	2.861	5	114	.018
	Based on Median	1.050	5	114	.392
	Based on Median and with adjusted df	1.050	5	77.751	.395
	Based on trimmed mean	2.770	5	114	.021
Interview_complete	Based on Mean	.447	5	114	.815
	Based on Median	.318	5	114	.901
	Based on Median and with adjusted df	.318	5	108.401	.901
	Based on trimmed mean	.413	5	114	.839
Interview_cognitive_functioning	Based on Mean	1.867	5	114	.105
	Based on Median	1.308	5	114	.265
	Based on Median and with adjusted df	1.308	5	94.505	.267
	Based on trimmed mean	1.780	5	114	.122
Interview_capability_to_testify	Based on Mean	2.325	5	114	.047
	Based on Median	1.964	5	114	.089
	Based on Median and with adjusted df	1.964	5	97.234	.091
	Based on trimmed mean	2.277	5	114	.052
Credibility_Interview	Based on Mean	.923	5	114	.469
	Based on Median	.711	5	114	.617
	Based on Median and with adjusted df	.711	5	102.623	.617
	Based on trimmed mean	.868	5	114	.505

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + MH_status_of_witness + Informed_uninformed + MH_status_of_witness * Informed_uninformed

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Interview_accurate	20.567[a]	5	4.113	4.081	.002	.152
	Interview_convincing	27.767[b]	5	5.553	3.409	.007	.130
	Interview_confident_account	41.375[c]	5	8.275	6.104	.000	.211
	Interview_confident_general	17.667[d]	5	3.533	1.780	.122	.072
	Interview_competent	19.942[e]	5	3.988	3.034	.013	.117
	Interview_honest	8.442[f]	5	1.688	1.454	.210	.060
	Interview_believable	34.300[g]	5	6.860	4.934	.000	.178
	Interview_complete	20.242[h]	5	4.048	2.448	.038	.097
	Interview_cognitive_functioning	32.975[i]	5	6.595	3.837	.003	.144
	Interview_capability_to_testify	18.267[j]	5	3.653	2.081	.073	.084
	Credibility_Interview	25.842[k]	5	5.168	4.042	.002	.151
Intercept	Interview_accurate	2688.533	1	2688.533	2667.474	.000	.959
	Interview_convincing	2358.533	1	2358.533	1447.888	.000	.927
	Interview_confident_account	2193.075	1	2193.075	1617.668	.000	.934
	Interview_confident_general	1628.033	1	1628.033	820.132	.000	.878
	Interview_competent	2385.208	1	2385.208	1814.573	.000	.941
	Interview_honest	3910.208	1	3910.208	3368.068	.000	.967
	Interview_believable	3121.200	1	3121.200	2244.901	.000	.952
	Interview_complete	1960.208	1	1960.208	1185.170	.000	.912
	Interview_cognitive_functioning	2736.075	1	2736.075	1591.797	.000	.933
	Interview_capability_to_testify	2669.633	1	2669.633	1520.931	.000	.930
	Credibility_Interview	2641.408	1	2641.408	2066.007	.000	.948
MH_status_of_witness	Interview_accurate	18.817	2	9.408	9.335	.000	.141
	Interview_convincing	26.517	2	13.258	8.139	.000	.125
	Interview_confident_account	39.650	2	19.825	14.623	.000	.204
	Interview_confident_general	17.017	2	8.508	4.286	.016	.070
	Interview_competent	18.317	2	9.158	6.967	.001	.109
	Interview_honest	7.917	2	3.958	3.410	.036	.056
	Interview_believable	33.800	2	16.900	12.155	.000	.176
	Interview_complete	17.717	2	8.858	5.356	.006	.086
	Interview_cognitive_functioning	24.450	2	12.225	7.112	.001	.111
	Interview_capability_to_testify	14.817	2	7.408	4.221	.017	.069
	Credibility_Interview	24.817	2	12.408	9.705	.000	.145
Informed_uninformed	Interview_accurate	1.633	1	1.633	1.621	.206	.014
	Interview_convincing	.300	1	.300	.184	.669	.002
	Interview_confident_account	.208	1	.208	.154	.696	.001
	Interview_confident_general	.000	1	.000	.000	1.000	.000
	Interview_competent	.075	1	.075	.057	.812	.001
	Interview_honest	.008	1	.008	.007	.933	.000
	Interview_believable	.300	1	.300	.216	.643	.002
	Interview_complete	1.875	1	1.875	1.134	.289	.010
	Interview_cognitive_functioning	.075	1	.075	.044	.835	.000
	Interview_capability_to_testify	2.133	1	2.133	1.215	.273	.011
	Credibility_Interview	.675	1	.675	.528	.469	.005

MH_status_of_witness * Informed_uninformed	Interview_accurate	.117	2	.058	.058	.944	.001
	Interview_convincing	.950	2	.475	.292	.748	.005
	Interview_confident_account	1.517	2	.758	.559	.573	.010
	Interview_confident_general	.650	2	.325	.164	.849	.003
	Interview_competent	1.550	2	.775	.590	.556	.010
	Interview_honest	.517	2	.258	.223	.801	.004
	Interview_believable	.200	2	.100	.072	.931	.001
	Interview_complete	.650	2	.325	.196	.822	.003
	Interview_cognitive_functioning	8.450	2	4.225	2.458	.090	.041
	Interview_capability_to_testify	1.317	2	.658	.375	.688	.007
	Credibility_Interview	.350	2	.175	.137	.872	.002
Error	Interview_accurate	114.900	114	1.008			
	Interview_convincing	185.700	114	1.629			
	Interview_confident_account	154.550	114	1.356			
	Interview_confident_general	226.300	114	1.985			
	Interview_competent	149.850	114	1.314			
	Interview_honest	132.350	114	1.161			
	Interview_believable	158.500	114	1.390			
	Interview_complete	188.550	114	1.654			
	Interview_cognitive_functioning	195.950	114	1.719			
	Interview_capability_to_testify	200.100	114	1.755			
	Credibility_Interview	145.750	114	1.279			
Total	Interview_accurate	2824.000	120				
	Interview_convincing	2572.000	120				
	Interview_confident_account	2389.000	120				
	Interview_confident_general	1872.000	120				
	Interview_competent	2555.000	120				
	Interview_honest	4051.000	120				
	Interview_believable	3314.000	120				
	Interview_complete	2169.000	120				
	Interview_cognitive_functioning	2965.000	120				
	Interview_capability_to_testify	2888.000	120				
	Credibility_Interview	2813.000	120				
Corrected Total	Interview_accurate	135.467	119				
	Interview_convincing	213.467	119				
	Interview_confident_account	195.925	119				
	Interview_confident_general	243.967	119				
	Interview_competent	169.792	119				
	Interview_honest	140.792	119				
	Interview_believable	192.800	119				
	Interview_complete	208.792	119				
	Interview_cognitive_functioning	228.925	119				
	Interview_capability_to_testify	218.367	119				
	Credibility_Interview	171.592	119				

a. R Squared = .152 (Adjusted R Squared = .115)

b. R Squared = .130 (Adjusted R Squared = .092)

c. R Squared = .211 (Adjusted R Squared = .177)

d. R Squared = .072 (Adjusted R Squared = .032)

e. R Squared = .117 (Adjusted R Squared = .079)

f. R Squared = .060 (Adjusted R Squared = .019)

g. R Squared = .178 (Adjusted R Squared = .142)

h. R Squared = .097 (Adjusted R Squared = .057)

i. R Squared = .144 (Adjusted R Squared = .107)

j. R Squared = .084 (Adjusted R Squared = .043)

k. R Squared = .151 (Adjusted R Squared = .113)

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) MH_status_of_witness	(J) MH_status_of_witness	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Interview_accurate	Typical	Anxiety & Depression	.88*	.224	.000	.34	1.41
		Anxiety only	.08	.224	.940	-.46	.61
	Anxiety & Depression	Typical	-.88*	.224	.000	-1.41	-.34
		Anxiety only	-.80*	.224	.002	-1.33	-.27
	Anxiety only	Typical	-.08	.224	.940	-.61	.46
		Anxiety & Depression	.80*	.224	.002	.27	1.33
Interview_convincing	Typical	Anxiety & Depression	1.13*	.285	.000	.45	1.80
		Anxiety only	.35	.285	.440	-.33	1.03
	Anxiety & Depression	Typical	-1.13*	.285	.000	-1.80	-.45
		Anxiety only	-.78*	.285	.021	-1.45	-.10
	Anxiety only	Typical	-.35	.285	.440	-1.03	.33
		Anxiety & Depression	.78*	.285	.021	.10	1.45
Interview_confident_account	Typical	Anxiety & Depression	1.33*	.260	.000	.71	1.94
		Anxiety only	.25	.260	.603	-.37	.87
	Anxiety & Depression	Typical	-1.33*	.260	.000	-1.94	-.71
		Anxiety only	-1.07*	.260	.000	-1.69	-.46
	Anxiety only	Typical	-.25	.260	.603	-.87	.37
		Anxiety & Depression	1.07*	.260	.000	.46	1.69
Interview_confident_general	Typical	Anxiety & Depression	.90*	.315	.014	.15	1.65
		Anxiety only	.27	.315	.658	-.47	1.02
	Anxiety & Depression	Typical	-.90*	.315	.014	-1.65	-.15
		Anxiety only	-.63	.315	.121	-1.37	.12
	Anxiety only	Typical	-.27	.315	.658	-1.02	.47
		Anxiety & Depression	.63	.315	.121	-.12	1.37
Interview_competent	Typical	Anxiety & Depression	.93*	.256	.001	.32	1.53
		Anxiety only	.25	.256	.594	-.36	.86
	Anxiety & Depression	Typical	-.93*	.256	.001	-1.53	-.32
		Anxiety only	-.68*	.256	.026	-1.28	-.07
	Anxiety only	Typical	-.25	.256	.594	-.86	.36
		Anxiety & Depression	.68*	.256	.026	.07	1.28
Interview_honest	Typical	Anxiety & Depression	.63*	.241	.029	.05	1.20
		Anxiety only	.25	.241	.555	-.32	.82
	Anxiety & Depression	Typical	-.63*	.241	.029	-1.20	-.05
		Anxiety only	-.38	.241	.269	-.95	.20
	Anxiety only	Typical	-.25	.241	.555	-.82	.32
		Anxiety & Depression	.38	.241	.269	-.20	.95
Interview_believable	Typical	Anxiety & Depression	1.15*	.264	.000	.52	1.78
		Anxiety only	.05	.264	.980	-.58	.68
	Anxiety & Depression	Typical	-1.15*	.264	.000	-1.78	-.52
		Anxiety only	-1.10*	.264	.000	-1.73	-.47
	Anxiety only	Typical	-.05	.264	.980	-.68	.58
		Anxiety & Depression	1.10*	.264	.000	.47	1.73
Interview_complete	Typical	Anxiety & Depression	.85*	.288	.011	.17	1.53
		Anxiety only	.08	.288	.963	-.61	.76
	Anxiety & Depression	Typical	-.85*	.288	.011	-1.53	-.17
		Anxiety only	-.77*	.288	.022	-1.46	-.09
	Anxiety only	Typical	-.08	.288	.963	-.76	.61
		Anxiety & Depression	.77*	.288	.022	.09	1.46
Interview_cognitive_functioning	Typical	Anxiety & Depression	1.05*	.293	.001	.35	1.75
		Anxiety only	.23	.293	.724	-.47	.92
	Anxiety & Depression	Typical	-1.05*	.293	.001	-1.75	-.35
		Anxiety only	-.83*	.293	.016	-1.52	-.13
	Anxiety only	Typical	-.23	.293	.724	-.92	.47
		Anxiety & Depression	.83*	.293	.016	.13	1.52
Interview_capability_to_testify	Typical	Anxiety & Depression	.80*	.296	.022	.10	1.50
		Anxiety only	.12	.296	.907	-.58	.83
	Anxiety & Depression	Typical	-.80*	.296	.022	-1.50	-.10
		Anxiety only	-.67	.296	.063	-1.38	.03
	Anxiety only	Typical	-.12	.296	.907	-.83	.58
		Anxiety & Depression	.67	.296	.063	-.03	1.38
Credibility_Interview	Typical	Anxiety & Depression	1.00*	.253	.000	.40	1.60
		Anxiety only	.07	.253	.953	-.53	.68
	Anxiety & Depression	Typical	-1.00*	.253	.000	-1.60	-.40
		Anxiety only	-.92*	.253	.001	-1.53	-.32
	Anxiety only	Typical	-.07	.253	.953	-.68	.53
		Anxiety & Depression	.92*	.253	.001	.32	1.53

Based on observed means.
The error term is Mean Square(Error) = 1.279.

*. The mean difference is significant at the .05 level.

MANOVA (effect of mental health status and knowledge on mock jurors' perceptions of the witness at cross-examination)

Descriptive Statistics

	MH_status_of_witness	Knowledge	Mean	Std. Deviation	N
CrossExam_accurate	Typical	Informed	4.75	1.164	20
		Uninformed	4.25	1.293	20
		Total	4.50	1.240	40
	Anxiety & Depression	Informed	3.80	1.322	20
		Uninformed	4.20	1.152	20
		Total	4.00	1.240	40
	Anxiety only	Informed	3.95	1.191	20
		Uninformed	3.90	1.071	20
		Total	3.93	1.118	40
	Total	Informed	4.17	1.278	60
		Uninformed	4.12	1.166	60
		Total	4.14	1.218	120
CrossExam_convincing	Typical	Informed	4.65	1.268	20
		Uninformed	4.35	1.424	20
		Total	4.50	1.340	40
	Anxiety & Depression	Informed	4.00	1.451	20
		Uninformed	4.40	1.142	20
		Total	4.20	1.305	40
	Anxiety only	Informed	4.05	1.395	20
		Uninformed	3.80	1.240	20
		Total	3.93	1.309	40
	Total	Informed	4.23	1.382	60
		Uninformed	4.18	1.282	60
		Total	4.21	1.328	120
CrossExam_confident_account	Typical	Informed	4.75	1.209	20
		Uninformed	4.40	1.465	20
		Total	4.58	1.338	40
	Anxiety & Depression	Informed	4.40	1.273	20
		Uninformed	4.20	1.281	20
		Total	4.30	1.265	40
	Anxiety only	Informed	3.80	1.735	20
		Uninformed	4.25	1.118	20
		Total	4.03	1.459	40
	Total	Informed	4.32	1.455	60
		Uninformed	4.28	1.277	60
		Total	4.30	1.363	120
CrossExam_confident_general	Typical	Informed	4.85	1.309	20
		Uninformed	4.25	1.410	20
		Total	4.55	1.377	40
	Anxiety & Depression	Informed	5.05	1.099	20
		Uninformed	4.50	1.235	20
		Total	4.77	1.187	40
	Anxiety only	Informed	4.05	1.572	20
		Uninformed	4.55	1.234	20
		Total	4.30	1.418	40
	Total	Informed	4.65	1.388	60
		Uninformed	4.43	1.280	60
		Total	4.54	1.334	120
CrossExam_competent	Typical	Informed	4.65	1.226	20
		Uninformed	4.60	1.429	20
		Total	4.63	1.314	40
	Anxiety & Depression	Informed	4.40	1.273	20
		Uninformed	4.25	1.209	20
		Total	4.32	1.228	40
	Anxiety only	Informed	3.95	1.468	20
		Uninformed	4.35	1.348	20
		Total	4.15	1.406	40
	Total	Informed	4.33	1.336	60
		Uninformed	4.40	1.317	60
		Total	4.37	1.322	120
CrossExam_honest	Typical	Informed	6.20	.696	20
		Uninformed	5.90	1.119	20
		Total	6.05	.932	40
	Anxiety & Depression	Informed	6.00	.918	20
		Uninformed	5.65	.813	20
		Total	5.83	.874	40
	Anxiety only	Informed	5.40	1.465	20
		Uninformed	5.60	.883	20
		Total	5.50	1.198	40
	Total	Informed	5.87	1.112	60
		Uninformed	5.72	.940	60
		Total	5.79	1.028	120

CrossExam_believable	Typical	Informed	5.55	.887	20
		Uninformed	5.30	1.261	20
		Total	5.42	1.083	40
	Anxiety & Depression	Informed	4.80	1.322	20
		Uninformed	4.90	1.021	20
		Total	4.85	1.167	40
	Anxiety only	Informed	4.85	1.309	20
		Uninformed	4.70	1.081	20
		Total	4.78	1.187	40
	Total	Informed	5.07	1.219	60
		Uninformed	4.97	1.134	60
		Total	5.02	1.174	120
CrossExam_complete	Typical	Informed	4.00	1.214	20
		Uninformed	3.65	1.496	20
		Total	3.82	1.357	40
	Anxiety & Depression	Informed	3.15	1.268	20
		Uninformed	3.55	1.395	20
		Total	3.35	1.331	40
	Anxiety only	Informed	3.35	.988	20
		Uninformed	3.35	.813	20
		Total	3.35	.893	40
	Total	Informed	3.50	1.200	60
		Uninformed	3.52	1.255	60
		Total	3.51	1.223	120
CrossExam_cognitive_functioning	Typical	Informed	5.50	1.100	20
		Uninformed	4.90	1.373	20
		Total	5.20	1.265	40
	Anxiety & Depression	Informed	4.20	1.642	20
		Uninformed	4.90	1.252	20
		Total	4.55	1.484	40
	Anxiety only	Informed	4.90	1.294	20
		Uninformed	4.65	1.309	20
		Total	4.78	1.291	40
	Total	Informed	4.87	1.443	60
		Uninformed	4.82	1.295	60
		Total	4.84	1.366	120
CrossExam_capability_to_testify	Typical	Informed	5.60	1.314	20
		Uninformed	4.90	1.586	20
		Total	5.25	1.481	40
	Anxiety & Depression	Informed	4.95	1.050	20
		Uninformed	4.35	1.694	20
		Total	4.65	1.424	40
	Anxiety only	Informed	4.60	1.603	20
		Uninformed	4.65	1.496	20
		Total	4.62	1.531	40
	Total	Informed	5.05	1.383	60
		Uninformed	4.63	1.583	60
		Total	4.84	1.495	120
Credibility_CrossExam	Typical	Informed	4.90	1.210	20
		Uninformed	4.40	1.392	20
		Total	4.65	1.312	40
	Anxiety & Depression	Informed	4.40	1.501	20
		Uninformed	4.05	1.317	20
		Total	4.23	1.405	40
	Anxiety only	Informed	4.30	1.218	20
		Uninformed	3.75	1.293	20
		Total	4.02	1.271	40
	Total	Informed	4.53	1.321	60
		Uninformed	4.07	1.339	60
		Total	4.30	1.345	120

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.978	428.873[b]	11.000	104.000	.000	.978
	Wilks' Lambda	.022	428.873[b]	11.000	104.000	.000	.978
	Hotelling's Trace	45.362	428.873[b]	11.000	104.000	.000	.978
	Roy's Largest Root	45.362	428.873[b]	11.000	104.000	.000	.978
MH_status_of_witness	Pillai's Trace	.198	1.050	22.000	210.000	.405	.099
	Wilks' Lambda	.810	1.049[b]	22.000	208.000	.406	.100
	Hotelling's Trace	.224	1.048	22.000	206.000	.408	.101
	Roy's Largest Root	.158	1.506[c]	11.000	105.000	.140	.136
Knowledge	Pillai's Trace	.145	1.600[b]	11.000	104.000	.109	.145
	Wilks' Lambda	.855	1.600[b]	11.000	104.000	.109	.145
	Hotelling's Trace	.169	1.600[b]	11.000	104.000	.109	.145
	Roy's Largest Root	.169	1.600[b]	11.000	104.000	.109	.145
MH_status_of_witness * Knowledge	Pillai's Trace	.374	2.195	22.000	210.000	.002	.187
	Wilks' Lambda	.649	2.282[b]	22.000	208.000	.001	.194
	Hotelling's Trace	.506	2.368	22.000	206.000	.001	.202
	Roy's Largest Root	.422	4.033[c]	11.000	105.000	.000	.297

a. Design: Intercept + MH_status_of_witness + Knowledge + MH_status_of_witness * Knowledge

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
CrossExam_accurate	Based on Mean	.434	5	114	.824
	Based on Median	.566	5	114	.726
	Based on Median and with adjusted df	.566	5	105.350	.725
	Based on trimmed mean	.447	5	114	.815
CrossExam_convincing	Based on Mean	.407	5	114	.843
	Based on Median	.418	5	114	.836
	Based on Median and with adjusted df	.418	5	106.898	.835
	Based on trimmed mean	.419	5	114	.835
CrossExam_confident_account	Based on Mean	1.511	5	114	.192
	Based on Median	1.187	5	114	.320
	Based on Median and with adjusted df	1.187	5	104.272	.321
	Based on trimmed mean	1.525	5	114	.188
CrossExam_confident_general	Based on Mean	.941	5	114	.457
	Based on Median	.980	5	114	.433
	Based on Median and with adjusted df	.980	5	100.042	.434
	Based on trimmed mean	.922	5	114	.470
CrossExam_competent	Based on Mean	.837	5	114	.526
	Based on Median	.886	5	114	.493
	Based on Median and with adjusted df	.886	5	110.031	.493
	Based on trimmed mean	.819	5	114	.538
CrossExam_honest	Based on Mean	1.211	5	114	.308
	Based on Median	.295	5	114	.915
	Based on Median and with adjusted df	.295	5	66.757	.914
	Based on trimmed mean	.686	5	114	.635
CrossExam_believable	Based on Mean	1.673	5	114	.147
	Based on Median	1.435	5	114	.217
	Based on Median and with adjusted df	1.435	5	104.113	.218
	Based on trimmed mean	1.519	5	114	.189
CrossExam_complete	Based on Mean	2.005	5	114	.083
	Based on Median	2.352	5	114	.045
	Based on Median and with adjusted df	2.352	5	109.883	.045
	Based on trimmed mean	2.044	5	114	.078
CrossExam_cognitive_functioning	Based on Mean	1.000	5	114	.421
	Based on Median	.968	5	114	.441
	Based on Median and with adjusted df	.968	5	110.732	.441
	Based on trimmed mean	.991	5	114	.426
CrossExam_capability_to_testify	Based on Mean	1.732	5	114	.133
	Based on Median	1.568	5	114	.175
	Based on Median and with adjusted df	1.568	5	104.736	.176
	Based on trimmed mean	1.732	5	114	.133
Credibility_CrossExam	Based on Mean	.535	5	114	.750
	Based on Median	.380	5	114	.862
	Based on Median and with adjusted df	.380	5	104.469	.862
	Based on trimmed mean	.537	5	114	.748

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + MH_status_of_witness + Knowledge + MH_status_of_witness * Knowledge

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	CrossExam_accurate	11.942[a]	5	2.388	1.654	.152	.068
	CrossExam_convincing	9.742[b]	5	1.948	1.110	.359	.046
	CrossExam_confident_account	9.700[c]	5	1.940	1.046	.394	.044
	CrossExam_confident_general	13.642[d]	5	2.728	1.570	.174	.064
	CrossExam_competent	6.467[e]	5	1.293	.732	.601	.031
	CrossExam_honest	8.642[f]	5	1.728	1.682	.145	.069
	CrossExam_believable	11.067[g]	5	2.213	1.650	.152	.067
	CrossExam_complete	8.842[h]	5	1.768	1.192	.318	.050
	CrossExam_cognitive_functioning	17.842[i]	5	3.568	1.993	.085	.080
	CrossExam_capability_to_testify	18.542[j]	5	3.708	1.708	.138	.070
	Credibility_CrossExam	14.900[k]	5	2.980	1.696	.141	.069
Intercept	CrossExam_accurate	2058.408	1	2058.408	1425.196	.000	.926
	CrossExam_convincing	2125.208	1	2125.208	1211.066	.000	.914
	CrossExam_confident_account	2218.800	1	2218.800	1195.949	.000	.913
	CrossExam_confident_general	2475.208	1	2475.208	1424.041	.000	.926
	CrossExam_competent	2288.133	1	2288.133	1295.170	.000	.919
	CrossExam_honest	4025.208	1	4025.208	3916.976	.000	.972
	CrossExam_believable	3020.033	1	3020.033	2251.693	.000	.952
	CrossExam_complete	1477.008	1	1477.008	995.442	.000	.897
	CrossExam_cognitive_functioning	2813.008	1	2813.008	1570.820	.000	.932
	CrossExam_capability_to_testify	2813.008	1	2813.008	1295.950	.000	.919
	Credibility_CrossExam	2218.800	1	2218.800	1262.822	.000	.917
MH_status_of_witness	CrossExam_accurate	7.817	2	3.908	2.706	.071	.045
	CrossExam_convincing	6.617	2	3.308	1.885	.156	.032
	CrossExam_confident_account	6.050	2	3.025	1.630	.200	.028
	CrossExam_confident_general	4.517	2	2.258	1.299	.277	.022
	CrossExam_competent	4.617	2	2.308	1.307	.275	.022
	CrossExam_honest	6.117	2	3.058	2.976	.055	.050
	CrossExam_believable	10.117	2	5.058	3.771	.026	.062
	CrossExam_complete	6.017	2	3.008	2.027	.136	.034
	CrossExam_cognitive_functioning	8.717	2	4.358	2.434	.092	.041
	CrossExam_capability_to_testify	10.017	2	5.008	2.307	.104	.039
	Credibility_CrossExam	8.150	2	4.075	2.319	.103	.039
Knowledge	CrossExam_accurate	.075	1	.075	.052	.820	.000
	CrossExam_convincing	.075	1	.075	.043	.837	.000
	CrossExam_confident_account	.033	1	.033	.018	.894	.000
	CrossExam_confident_general	1.408	1	1.408	.810	.370	.007
	CrossExam_competent	.133	1	.133	.075	.784	.001
	CrossExam_honest	.675	1	.675	.657	.419	.006
	CrossExam_believable	.300	1	.300	.224	.637	.002
	CrossExam_complete	.008	1	.008	.006	.940	.000
	CrossExam_cognitive_functioning	.075	1	.075	.042	.838	.000
	CrossExam_capability_to_testify	5.208	1	5.208	2.399	.124	.021
	Credibility_CrossExam	6.533	1	6.533	3.718	.056	.032

MH_status_of_witness * Knowledge	CrossExam_accurate	4.050	2	2.025	1.402	.250	.024
	CrossExam_convincing	3.050	2	1.525	.869	.422	.015
	CrossExam_confident_account	3.617	2	1.808	.975	.380	.017
	CrossExam_confident_general	7.717	2	3.858	2.220	.113	.037
	CrossExam_competent	1.717	2	.858	.486	.616	.008
	CrossExam_honest	1.850	2	.925	.900	.409	.016
	CrossExam_believable	.650	2	.325	.242	.785	.004
	CrossExam_complete	2.817	2	1.408	.949	.390	.016
	CrossExam_cognitive_functioning	9.050	2	4.525	2.527	.084	.042
	CrossExam_capability_to_testify	3.317	2	1.658	.764	.468	.013
	Credibility_CrossExam	.217	2	.108	.062	.940	.001
Error	CrossExam_accurate	164.650	114	1.444			
	CrossExam_convincing	200.050	114	1.755			
	CrossExam_confident_account	211.500	114	1.855			
	CrossExam_confident_general	198.150	114	1.738			
	CrossExam_competent	201.400	114	1.767			
	CrossExam_honest	117.150	114	1.028			
	CrossExam_believable	152.900	114	1.341			
	CrossExam_complete	169.150	114	1.484			
	CrossExam_cognitive_functioning	204.150	114	1.791			
	CrossExam_capability_to_testify	247.450	114	2.171			
	Credibility_CrossExam	200.300	114	1.757			
Total	CrossExam_accurate	2235.000	120				
	CrossExam_convincing	2335.000	120				
	CrossExam_confident_account	2440.000	120				
	CrossExam_confident_general	2687.000	120				
	CrossExam_competent	2496.000	120				
	CrossExam_honest	4151.000	120				
	CrossExam_believable	3184.000	120				
	CrossExam_complete	1655.000	120				
	CrossExam_cognitive_functioning	3035.000	120				
	CrossExam_capability_to_testify	3079.000	120				
	Credibility_CrossExam	2434.000	120				
Corrected Total	CrossExam_accurate	176.592	119				
	CrossExam_convincing	209.792	119				
	CrossExam_confident_account	221.200	119				
	CrossExam_confident_general	211.792	119				
	CrossExam_competent	207.867	119				
	CrossExam_honest	125.792	119				
	CrossExam_believable	163.967	119				
	CrossExam_complete	177.992	119				
	CrossExam_cognitive_functioning	221.992	119				
	CrossExam_capability_to_testify	265.992	119				
	Credibility_CrossExam	215.200	119				

a. R Squared = .068 (Adjusted R Squared = .027)

b. R Squared = .046 (Adjusted R Squared = .005)

c. R Squared = .044 (Adjusted R Squared = .002)

d. R Squared = .064 (Adjusted R Squared = .023)

e. R Squared = .031 (Adjusted R Squared = -.011)

f. R Squared = .069 (Adjusted R Squared = .028)

g. R Squared = .067 (Adjusted R Squared = .027)

h. R Squared = .050 (Adjusted R Squared = .008)

i. R Squared = .080 (Adjusted R Squared = .040)

j. R Squared = .070 (Adjusted R Squared = .029)

k. R Squared = .069 (Adjusted R Squared = .028)

Pairwise Comparisons

Dependent Variable	Knowledge	(I) MH_status_of_witness	(J) MH_status_of_witness	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
							Lower Bound	Upper Bound
CrossExam_accurate	Informed	Typical	Anxiety & Depression	.950*	.380	.042	.027	1.873
			Anxiety only	.800	.380	.112	-.123	1.723
		Anxiety & Depression	Typical	-.950*	.380	.042	-1.873	-.027
			Anxiety only	-.150	.380	1.000	-1.073	.773
		Anxiety only	Typical	-.800	.380	.112	-1.723	.123
			Anxiety & Depression	.150	.380	1.000	-.773	1.073
	Uninformed	Typical	Anxiety & Depression	.050	.380	1.000	-.873	.973
			Anxiety only	.350	.380	1.000	-.573	1.273
		Anxiety & Depression	Typical	-.050	.380	1.000	-.973	.873
			Anxiety only	.300	.380	1.000	-.623	1.223
		Anxiety only	Typical	-.350	.380	1.000	-1.273	.573
			Anxiety & Depression	-.300	.380	1.000	-1.223	.623
CrossExam_convincing	Informed	Typical	Anxiety & Depression	.650	.419	.371	-.368	1.668
			Anxiety only	.600	.419	.464	-.418	1.618
		Anxiety & Depression	Typical	-.650	.419	.371	-1.668	.368
			Anxiety only	-.050	.419	1.000	-1.068	.968
		Anxiety only	Typical	-.600	.419	.464	-1.618	.418
			Anxiety & Depression	.050	.419	1.000	-.968	1.068
	Uninformed	Typical	Anxiety & Depression	-.050	.419	1.000	-1.068	.968
			Anxiety only	.550	.419	.576	-.468	1.568
		Anxiety & Depression	Typical	.050	.419	1.000	-.968	1.068
			Anxiety only	.600	.419	.464	-.418	1.618
		Anxiety only	Typical	-.550	.419	.576	-1.568	.468
			Anxiety & Depression	-.600	.419	.464	-1.618	.418
CrossExam_confident_account	Informed	Typical	Anxiety & Depression	.350	.431	1.000	-.697	1.397
			Anxiety only	.950	.431	.088	-.097	1.997
		Anxiety & Depression	Typical	-.350	.431	1.000	-1.397	.697
			Anxiety only	.600	.431	.499	-.447	1.647
		Anxiety only	Typical	-.950	.431	.088	-1.997	.097
			Anxiety & Depression	-.600	.431	.499	-1.647	.447
	Uninformed	Typical	Anxiety & Depression	.200	.431	1.000	-.847	1.247
			Anxiety only	.150	.431	1.000	-.897	1.197
		Anxiety & Depression	Typical	-.200	.431	1.000	-1.247	.847
			Anxiety only	-.050	.431	1.000	-1.097	.997
		Anxiety only	Typical	-.150	.431	1.000	-1.197	.897
			Anxiety & Depression	.050	.431	1.000	-.997	1.097
CrossExam_confident_general	Informed	Typical	Anxiety & Depression	-.200	.417	1.000	-1.213	.813
			Anxiety only	.800	.417	.173	-.213	1.813
		Anxiety & Depression	Typical	.200	.417	1.000	-.813	1.213
			Anxiety only	1.000	.417	.054	-.013	2.013
		Anxiety only	Typical	-.800	.417	.173	-1.813	.213
			Anxiety & Depression	-1.000	.417	.054	-2.013	.013
	Uninformed	Typical	Anxiety & Depression	-.250	.417	1.000	-1.263	.763
			Anxiety only	-.300	.417	1.000	-1.313	.713
		Anxiety & Depression	Typical	.250	.417	1.000	-.763	1.263
			Anxiety only	-.050	.417	1.000	-1.063	.963
		Anxiety only	Typical	.300	.417	1.000	-.713	1.313
			Anxiety & Depression	.050	.417	1.000	-.963	1.063
CrossExam_competent	Informed	Typical	Anxiety & Depression	.250	.420	1.000	-.771	1.271
			Anxiety only	.700	.420	.296	-.321	1.721
		Anxiety & Depression	Typical	-.250	.420	1.000	-1.271	.771
			Anxiety only	.450	.420	.860	-.571	1.471
		Anxiety only	Typical	-.700	.420	.296	-1.721	.321
			Anxiety & Depression	-.450	.420	.860	-1.471	.571
	Uninformed	Typical	Anxiety & Depression	.350	.420	1.000	-.671	1.371
			Anxiety only	.250	.420	1.000	-.771	1.271
		Anxiety & Depression	Typical	-.350	.420	1.000	-1.371	.671
			Anxiety only	-.100	.420	1.000	-1.121	.921
		Anxiety only	Typical	-.250	.420	1.000	-1.271	.771
			Anxiety & Depression	.100	.420	1.000	-.921	1.121
CrossExam_honest	Informed	Typical	Anxiety & Depression	.200	.321	1.000	-.579	.979
			Anxiety only	.800*	.321	.042	.021	1.579
		Anxiety & Depression	Typical	-.200	.321	1.000	-.979	.579
			Anxiety only	.600	.321	.191	-.179	1.379
		Anxiety only	Typical	-.800*	.321	.042	-1.579	-.021
			Anxiety & Depression	-.600	.321	.191	-1.379	.179
	Uninformed	Typical	Anxiety & Depression	.250	.321	1.000	-.529	1.029
			Anxiety only	.300	.321	1.000	-.479	1.079
		Anxiety & Depression	Typical	-.250	.321	1.000	-1.029	.529
			Anxiety only	.050	.321	1.000	-.729	.829
		Anxiety only	Typical	-.300	.321	1.000	-1.079	.479
			Anxiety & Depression	-.050	.321	1.000	-.829	.729

CrossExam_believable	Informed	Typical	Anxiety & Depression	.750	.366	.129	-.140	1.640
			Anxiety only	.700	.366	.175	-.190	1.590
		Anxiety & Depression	Typical	-.750	.366	.129	-1.640	.140
			Anxiety only	-.050	.366	1.000	-.940	.840
		Anxiety only	Typical	-.700	.366	.175	-1.590	.190
			Anxiety & Depression	.050	.366	1.000	-.840	.940
	Uninformed	Typical	Anxiety & Depression	.400	.366	.831	-.490	1.290
			Anxiety only	.600	.366	.312	-.290	1.490
		Anxiety & Depression	Typical	-.400	.366	.831	-1.290	.490
			Anxiety only	.200	.366	1.000	-.690	1.090
		Anxiety only	Typical	-.600	.366	.312	-1.490	.290
			Anxiety & Depression	-.200	.366	1.000	-1.090	.690
CrossExam_complete	Informed	Typical	Anxiety & Depression	.850	.385	.088	-.086	1.786
			Anxiety only	.650	.385	.283	-.286	1.586
		Anxiety & Depression	Typical	-.850	.385	.088	-1.786	.086
			Anxiety only	-.200	.385	1.000	-1.136	.736
		Anxiety only	Typical	-.650	.385	.283	-1.586	.286
			Anxiety & Depression	.200	.385	1.000	-.736	1.136
	Uninformed	Typical	Anxiety & Depression	.100	.385	1.000	-.836	1.036
			Anxiety only	.300	.385	1.000	-.636	1.236
		Anxiety & Depression	Typical	-.100	.385	1.000	-1.036	.836
			Anxiety only	.200	.385	1.000	-.736	1.136
		Anxiety only	Typical	-.300	.385	1.000	-1.236	.636
			Anxiety & Depression	-.200	.385	1.000	-1.136	.736
CrossExam_cognitive_functioning	Informed	Typical	Anxiety & Depression	1.300*	.423	.008	.272	2.328
			Anxiety only	.600	.423	.477	-.428	1.628
		Anxiety & Depression	Typical	-1.300*	.423	.008	-2.328	-.272
			Anxiety only	-.700	.423	.303	-1.728	.328
		Anxiety only	Typical	-.600	.423	.477	-1.628	.428
			Anxiety & Depression	.700	.423	.303	-.328	1.728
	Uninformed	Typical	Anxiety & Depression	-5.551E-17	.423	1.000	-1.028	1.028
			Anxiety only	.250	.423	1.000	-.778	1.278
		Anxiety & Depression	Typical	5.551E-17	.423	1.000	-1.028	1.028
			Anxiety only	.250	.423	1.000	-.778	1.278
		Anxiety only	Typical	-.250	.423	1.000	-1.278	.778
			Anxiety & Depression	-.250	.423	1.000	-1.278	.778
CrossExam_capability_to_testify	Informed	Typical	Anxiety & Depression	.650	.466	.497	-.482	1.782
			Anxiety only	1.000	.466	.102	-.132	2.132
		Anxiety & Depression	Typical	-.650	.466	.497	-1.782	.482
			Anxiety only	.350	.466	1.000	-.782	1.482
		Anxiety only	Typical	-1.000	.466	.102	-2.132	.132
			Anxiety & Depression	-.350	.466	1.000	-1.482	.782
	Uninformed	Typical	Anxiety & Depression	.550	.466	.721	-.582	1.682
			Anxiety only	.250	.466	1.000	-.882	1.382
		Anxiety & Depression	Typical	-.550	.466	.721	-1.682	.582
			Anxiety only	-.300	.466	1.000	-1.432	.832
		Anxiety only	Typical	-.250	.466	1.000	-1.382	.882
			Anxiety & Depression	.300	.466	1.000	-.832	1.432
Credibility_CrossExam	Informed	Typical	Anxiety & Depression	.500	.419	.706	-.519	1.519
			Anxiety only	.600	.419	.465	-.419	1.619
		Anxiety & Depression	Typical	-.500	.419	.706	-1.519	.519
			Anxiety only	.100	.419	1.000	-.919	1.119
		Anxiety only	Typical	-.600	.419	.465	-1.619	.419
			Anxiety & Depression	-.100	.419	1.000	-1.119	.919
	Uninformed	Typical	Anxiety & Depression	.350	.419	1.000	-.669	1.369
			Anxiety only	.650	.419	.371	-.369	1.669
		Anxiety & Depression	Typical	-.350	.419	1.000	-1.369	.669
			Anxiety only	.300	.419	1.000	-.719	1.319
		Anxiety only	Typical	-.650	.419	.371	-1.669	.369
			Anxiety & Depression	-.300	.419	1.000	-1.319	.719

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Appendix GG

ANOVA: effect of mental health status and knowledge on mock jurors' perceptions of overall credibility (study 4)

Descriptive Statistics

Dependent Variable: Credibility_Overall

MH_status_of_witness	Informed_uninformed	Mean	Std. Deviation	N
Typical	Informed	5.15	.933	20
	Uninformed	4.60	1.231	20
	Total	4.88	1.114	40
Anxiety & Depression	Informed	4.10	1.294	20
	Uninformed	4.00	1.338	20
	Total	4.05	1.300	40
Anxiety only	Informed	4.30	1.081	20
	Uninformed	4.35	.875	20
	Total	4.32	.971	40
Total	Informed	4.52	1.186	60
	Uninformed	4.32	1.172	60
	Total	4.42	1.178	120

Levene's Test of Equality of Error Variances[a,b]

		Levene Statistic	df1	df2	Sig.
Credibility_Overall	Based on Mean	1.171	5	114	.328
	Based on Median	.993	5	114	.425
	Based on Median and with adjusted df	.993	5	101.048	.426
	Based on trimmed mean	1.147	5	114	.340

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: Credibility_Overall

b. Design: Intercept + MH_status_of_witness + Informed_uninformed + MH_status_of_witness * Informed_uninformed

Tests of Between-Subjects Effects

Dependent Variable: Credibility_Overall

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	17.267[a]	5	3.453	2.662	.026	.105
Intercept	2340.833	1	2340.833	1804.293	.000	.941
MH_status_of_witness	14.117	2	7.058	5.441	.006	.087
Informed_uninformed	1.200	1	1.200	.925	.338	.008
MH_status_of_witness * Informed_uninformed	1.950	2	.975	.752	.474	.013
Error	147.900	114	1.297			
Total	2506.000	120				
Corrected Total	165.167	119				

a. R Squared = .105 (Adjusted R Squared = .065)

Multiple Comparisons

Dependent Variable: Credibility_Overall

Tukey HSD

(I) MH_status_of_witness	(J) MH_status_of_witness	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Typical	Anxiety & Depression	.83*	.255	.004	.22	1.43
	Anxiety only	.55	.255	.083	-.05	1.15
Anxiety & Depression	Typical	-.83*	.255	.004	-1.43	-.22
	Anxiety only	-.27	.255	.529	-.88	.33
Anxiety only	Typical	-.55	.255	.083	-1.15	.05
	Anxiety & Depression	.27	.255	.529	-.33	.88

Based on observed means.
The error term is Mean Square(Error) = 1.297.

*. The mean difference is significant at the .05 level.

Appendix HH

Loglinear analysis: associations between mental health status and knowledge and verdict (study 4)

Cell Counts and Residuals

MH_status_of_witness	Informed_uninformed	Guilty	Observed Count[a]	Observed %	Expected Count	Expected %	Residuals	Std. Residuals
Typical	Informed	Guilty	18.500	15.4%	18.500	15.4%	.000	.000
		Not guilty	2.500	2.1%	2.500	2.1%	.000	.000
	Uninformed	Guilty	16.500	13.8%	16.500	13.8%	.000	.000
		Not guilty	4.500	3.8%	4.500	3.8%	.000	.000
Anxiety & Depression	Informed	Guilty	11.500	9.6%	11.500	9.6%	.000	.000
		Not guilty	9.500	7.9%	9.500	7.9%	.000	.000
	Uninformed	Guilty	14.500	12.1%	14.500	12.1%	.000	.000
		Not guilty	6.500	5.4%	6.500	5.4%	.000	.000
Anxiety only	Informed	Guilty	12.500	10.4%	12.500	10.4%	.000	.000
		Not guilty	8.500	7.1%	8.500	7.1%	.000	.000
	Uninformed	Guilty	9.500	7.9%	9.500	7.9%	.000	.000
		Not guilty	11.500	9.6%	11.500	9.6%	.000	.000

a. For saturated models, .500 has been added to all observed cells.

Goodness-of-Fit Tests

	Chi-Square	df	Sig.
Likelihood Ratio	.000	0	.
Pearson	.000	0	.

K-Way and Higher-Order Effects

	K	df	Likelihood Ratio Chi-Square	Likelihood Ratio Sig.	Pearson Chi-Square	Pearson Sig.	Number of Iterations
K-way and Higher Order Effects[a]	1	11	26.930	.005	24.400	.011	0
	2	7	13.338	.064	12.450	.087	2
	3	2	2.504	.286	2.489	.288	3
K-way Effects[b]	1	4	13.592	.009	11.950	.018	0
	2	5	10.834	.055	9.961	.076	0
	3	2	2.504	.286	2.489	.288	0

a. Tests that k-way and higher order effects are zero.

b. Tests that k-way effects are zero.

Partial Associations

Effect	df	Partial Chi-Square	Sig.	Number of Iterations
MH_status_of_witness*Informed_uninformed	2	.014	.993	2
MH_status_of_witness*Guilty	2	10.683	.005	2
Informed_uninformed*Guilty	1	.164	.686	2
MH_status_of_witness	2	.000	1.000	2
Informed_uninformed	1	.000	1.000	2
Guilty	1	13.592	.000	1

Parameter Estimates

Effect	Parameter	Estimate	Std. Error	Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
MH_status_of_witness*Informed_uninformed*Guilty	1	.120	.161	.743	.458	-.196	.436
	2	-.208	.139	-1.498	.134	-.481	.064
MH_status_of_witness*Informed_uninformed	1	-.089	.161	-.551	.582	-.405	.228
	2	.066	.139	.477	.633	-.206	.339
MH_status_of_witness*Guilty	1	.451	.161	2.795	.005	.135	.768
	2	-.126	.139	-.904	.366	-.398	.147
Informed_uninformed*Guilty	1	.056	.103	.538	.591	-.147	.258
MH_status_of_witness	1	-.193	.161	-1.196	.232	-.509	.123
	2	.082	.139	.586	.558	-.191	.354
Informed_uninformed	1	-.029	.103	-.285	.776	-.232	.173
Guilty	1	.374	.103	3.615	.000	.171	.577

Step Summary

Step[a]			Effects	Chi-Square[c]	df	Sig.	Number of Iterations
0	Generating Class[b]		MH_status_of_witness*Informed_uninformed*Guilty	.000	0	.	
	Deleted Effect	1	MH_status_of_witness*Informed_uninformed*Guilty	2.504	2	.286	3
1	Generating Class[b]		MH_status_of_witness*Informed_uninformed, MH_status_of_witness*Guilty, Informed_uninformed*Guilty	2.504	2	.286	
	Deleted Effect	1	MH_status_of_witness*Informed_uninformed	.014	2	.993	2
		2	MH_status_of_witness*Guilty	10.683	2	.005	2
		3	Informed_uninformed*Guilty	.164	1	.686	2
2	Generating Class[b]		MH_status_of_witness*Guilty, Informed_uninformed*Guilty	2.518	4	.641	
	Deleted Effect	1	MH_status_of_witness*Guilty	10.670	2	.005	2
		2	Informed_uninformed*Guilty	.150	1	.698	2
3	Generating Class[b]		MH_status_of_witness*Guilty, Informed_uninformed	2.668	5	.751	
	Deleted Effect	1	MH_status_of_witness*Guilty	10.670	2	.005	2
		2	Informed_uninformed	.000	1	1.000	2
4	Generating Class[b]		MH_status_of_witness*Guilty	2.668	6	.849	
	Deleted Effect	1	MH_status_of_witness*Guilty	10.670	2	.005	2
5	Generating Class[b]		MH_status_of_witness*Guilty	2.668	6	.849	

a. At each step, the effect with the largest significance level for the Likelihood Ratio Change is deleted, provided the significance level is larger than .050.

b. Statistics are displayed for the best model at each step after step 0.

c. For 'Deleted Effect', this is the change in the Chi-Square after the effect is deleted from the model.

Cell Counts and Residuals

MH_status_of_witness	Informed_uninformed	Guilty	Observed Count	Observed %	Expected Count	Expected %	Residuals	Std. Residuals
Typical	Informed	Guilty	18.000	15.0%	17.000	14.2%	1.000	.243
		Not guilty	2.000	1.7%	3.000	2.5%	-1.000	-.577
	Uninformed	Guilty	16.000	13.3%	17.000	14.2%	-1.000	-.243
		Not guilty	4.000	3.3%	3.000	2.5%	1.000	.577
Anxiety & Depression	Informed	Guilty	11.000	9.2%	12.500	10.4%	-1.500	-.424
		Not guilty	9.000	7.5%	7.500	6.3%	1.500	.548
	Uninformed	Guilty	14.000	11.7%	12.500	10.4%	1.500	.424
		Not guilty	6.000	5.0%	7.500	6.3%	-1.500	-.548
Anxiety only	Informed	Guilty	12.000	10.0%	10.500	8.8%	1.500	.463
		Not guilty	8.000	6.7%	9.500	7.9%	-1.500	-.487
	Uninformed	Guilty	9.000	7.5%	10.500	8.8%	-1.500	-.463
		Not guilty	11.000	9.2%	9.500	7.9%	1.500	.487

Goodness-of-Fit Tests

	Chi-Square	df	Sig.
Likelihood Ratio	2.668	6	.849
Pearson	2.647	6	.852

Appendix II

Chi-square test: association between mental health status and verdict (study 4)

MH_status_of_witness * Guilty Crosstabulation

			Guilty		
			Guilty	Not guilty	Total
MH_status_of_witness	Typical	Count	34	6	40
		Expected Count	26.7	13.3	40.0
		% within MH_status_of_witness	85.0%	15.0%	100.0%
		% within Guilty	42.5%	15.0%	33.3%
		% of Total	28.3%	5.0%	33.3%
		Standardized Residual	1.4	-2.0	
	Anxiety & Depression	Count	25	15	40
		Expected Count	26.7	13.3	40.0
		% within MH_status_of_witness	62.5%	37.5%	100.0%
		% within Guilty	31.3%	37.5%	33.3%
		% of Total	20.8%	12.5%	33.3%
		Standardized Residual	-.3	.5	
	Anxiety only	Count	21	19	40
		Expected Count	26.7	13.3	40.0
		% within MH_status_of_witness	52.5%	47.5%	100.0%
		% within Guilty	26.3%	47.5%	33.3%
		% of Total	17.5%	15.8%	33.3%
		Standardized Residual	-1.1	1.6	
Total		Count	80	40	120
		Expected Count	80.0	40.0	120.0
		% within MH_status_of_witness	66.7%	33.3%	100.0%
		% within Guilty	100.0%	100.0%	100.0%
		% of Total	66.7%	33.3%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	9.975[a]	2	.007
Likelihood Ratio	10.670	2	.005
Linear-by-Linear Association	9.427	1	.002
N of Valid Cases	120		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.33.